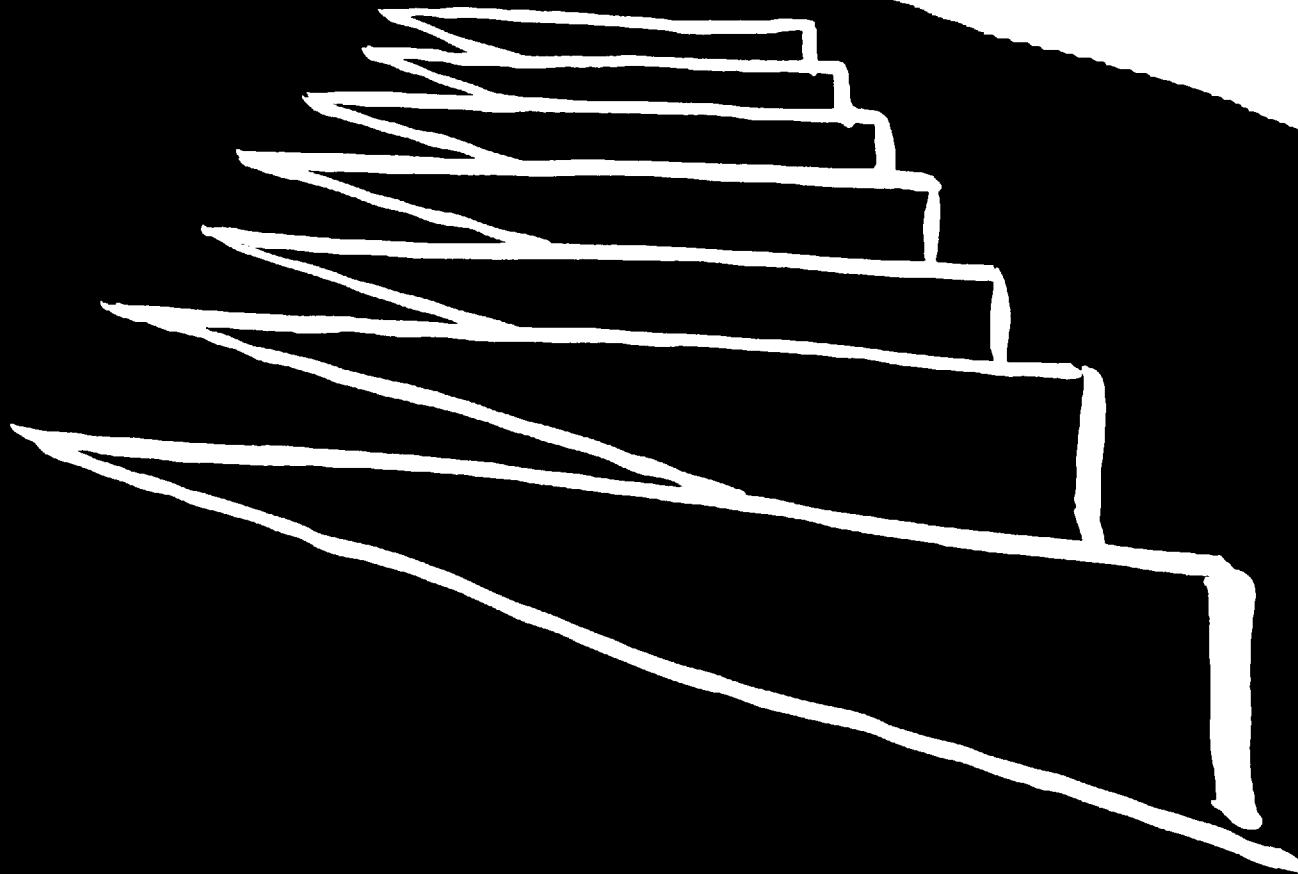


An Architecture of Reconciliation

Carlton Robert Bolton





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Thesis submitted to the faculty of Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Master of Architecture

William Brown, *Chairman*

Hans C. Rott

Michael O'Brien

September 12, 2001

Acknowledgments

I am indebted to Bill Brown, Hans Rott and Mike O'Brien for their guidance and insight during this journey. I would also like to thank Bill Galloway for his help along the way. In addition I would like to express my thanks to the entire staff of the art and architecture library for their thoughtful attention.

To my colleagues, I thank you for your discourse, camaraderie, and enthusiasm.

Finally, I would like to thank my wife Audrey for her love, assistance, and patience.





"A great building, in my opinion, must begin with the unmeasurable, must go through measurable means when it is being designed and in the end must be unmeasurable."

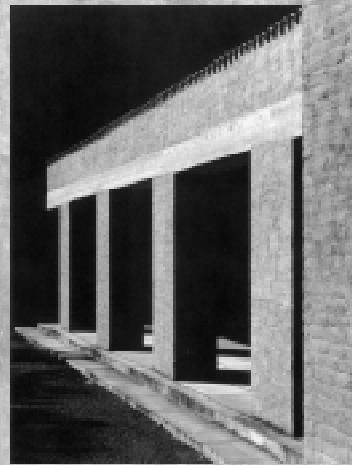
Louis Kahn

Introduction

Sometimes one begins a journey with a simple question. When the destination is reached, many times one finds that there are far more questions to be answered than the original query. Such is the case with this thesis. The original question was how to bring order to both a singular room and to the site as a whole. The questions that followed formed my way of seeing, thinking and drawing.

Presented in the following pages is a record of the architectural design process, with wall as primary element. The wall is seen as the generator of both order and structure. This order and structure reconcile the idea with the built form. Architecture is found within this reconciliation.





Background: Couvent Sainte Marie de la Tourette by Le Corbusier. Inset Photos, Left to Right: Fountain, Le Thoronet Abbey. Chapterhouse, Le Thoronet Abbey. Dorter, Le Thoronet Abbey. Vaals Abbey by Dom Hans Van der Laan. Vaals Abbey by Dom Hans Van der Laan.

Sources: Monasticism and Meditation

The three major sources for this thesis project were: my interest in meditation and contemplation as a means for personal growth, my desire to work with a strong site, and my studies of the relationship between public and private spaces.

Various public/private types such as hostels, public housing and monasteries were considered. The formation of the project began in earnest while studying the history and traditions of the different monastic orders in western Europe. The cloister was designed as a world within itself, one which the outside world was not allowed to enter. Even so, the degree of isolation varied depending on the monastic order. The Franciscans and Dominicans, for example, were active in their communities while orders such as the Carthusians physically isolated themselves. This attitude of retreating from the world continued within the monastery walls. While most orders slept in communal dormitories, the Carthusians lived in what could be described as separate houses complete with private gardens. These two opposing examples of communal living provided a place for me to begin my studies.

This thesis project is a Catholic Retreat Center for the layperson; a place in which one can retreat from the world for a short time before returning to daily life. The program includes a chapel, a dining facility and individual rooms or *cells* to house the retreat's guests. The majority of the project's energy was focused on the design of these cells and the transformation of the site into an ordered whole. The decision was made to not fully develop the chapel and dining facilities.



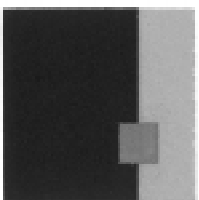
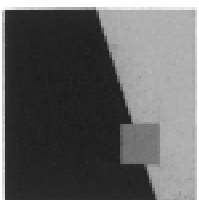
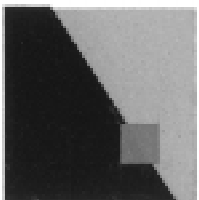
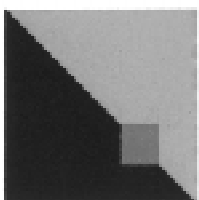
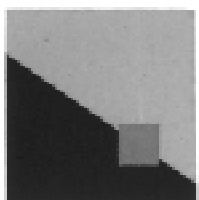
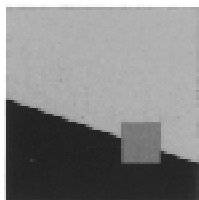
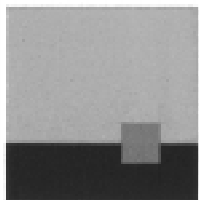
Cloister, Le Thoronet Abbey. Church Interior, Le Thoronet Abbey. Night Stairs, Huerta Abbey.

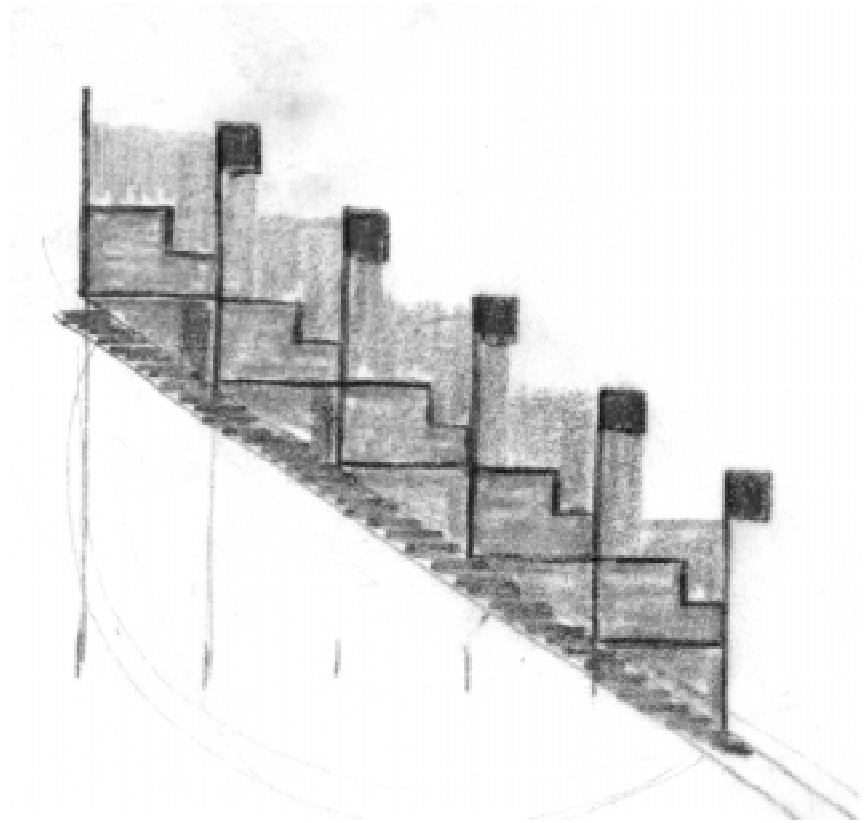
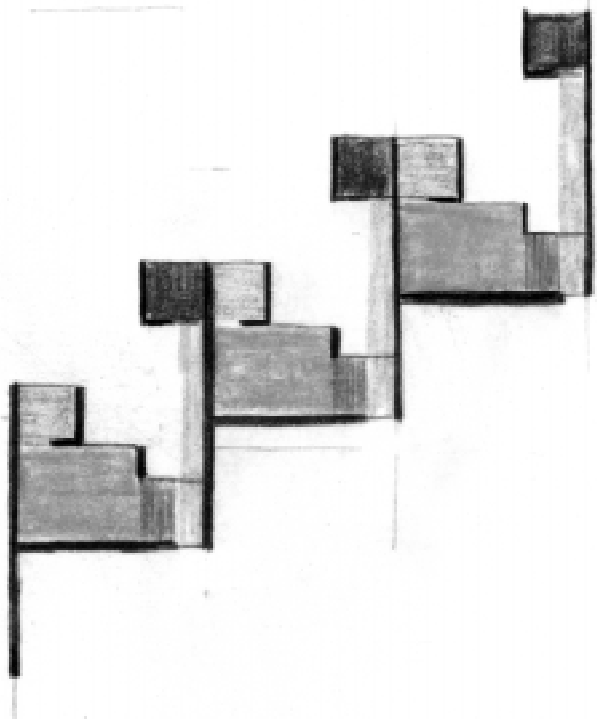
Site as Abstraction

I was interested in working with a strong site. After some initial research, I picked a site in Orange, Virginia that offered many opportunities due to its topography and vegetation.

A mixture of pasture and hardwood forest, the site slopes up to the northwest. In some parts the land rolls up the hill in waves of earth. In other parts the slope proceeds along at an orderly sixteen percent grade. At the top of the site views of the town of Orange to the northeast and views of the surrounding countryside to the southeast offer a variety of vistas.

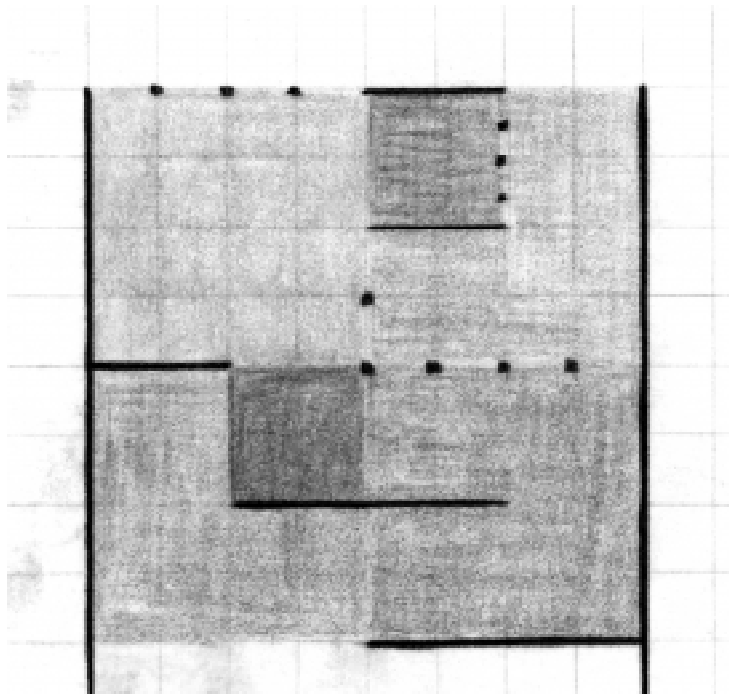
Even so, for most of the design process the site was thought of as an abstraction, much like the study on the page opposite. Early development concentrated on the *idea* of building on a slope. It was only as my thinking matured that I began to think about the material reality of what it means to build on a slope.





Meditation Chamber to Cell Relationship

In my early drawings and studies I searched for the relationship between the meditation chamber and the rest of the cell. The cell was to be used for normal daily activities of sleeping, bathing, writing, etc. The meditation chamber, however, was reserved solely for quiet contemplation. These drawings show my search for a balance in this relationship. Is it outside and separate from the cell, a separate structure entirely? Or is it the very core of the cell with the daily activities wrapped around the meditation chamber? In the end the meditation chamber became all of these things; a separate building within the cell. It is part of the cell, but *apart* from the cell.

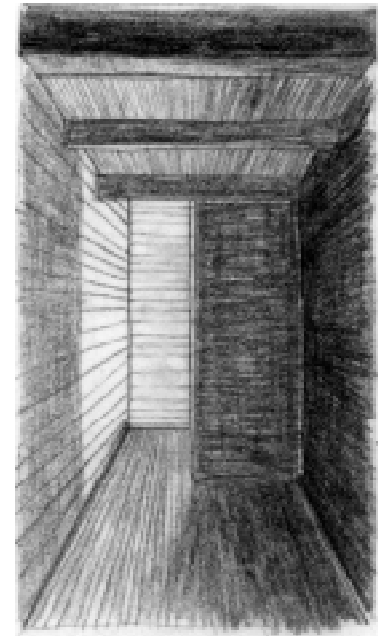
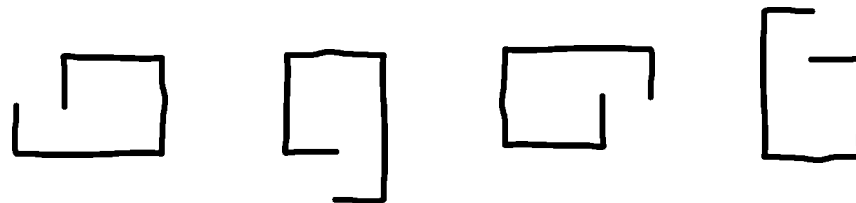


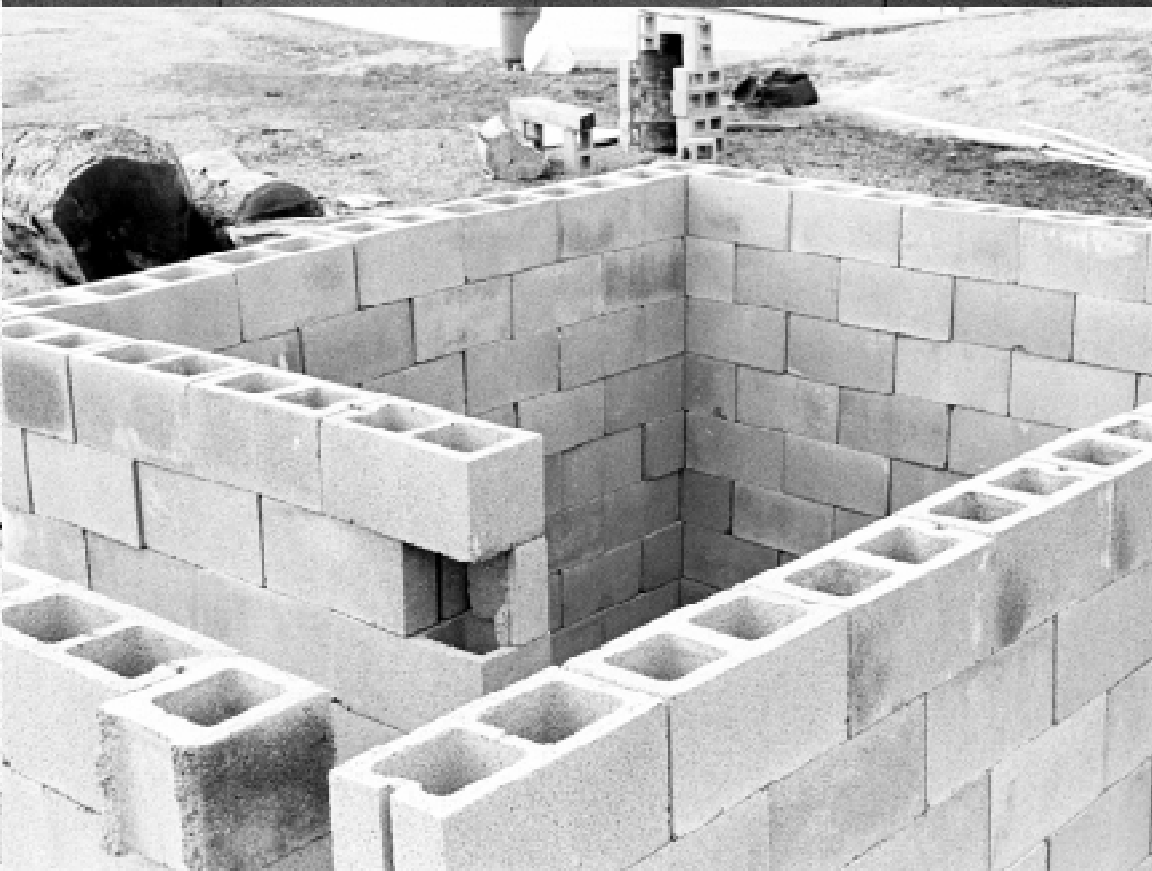
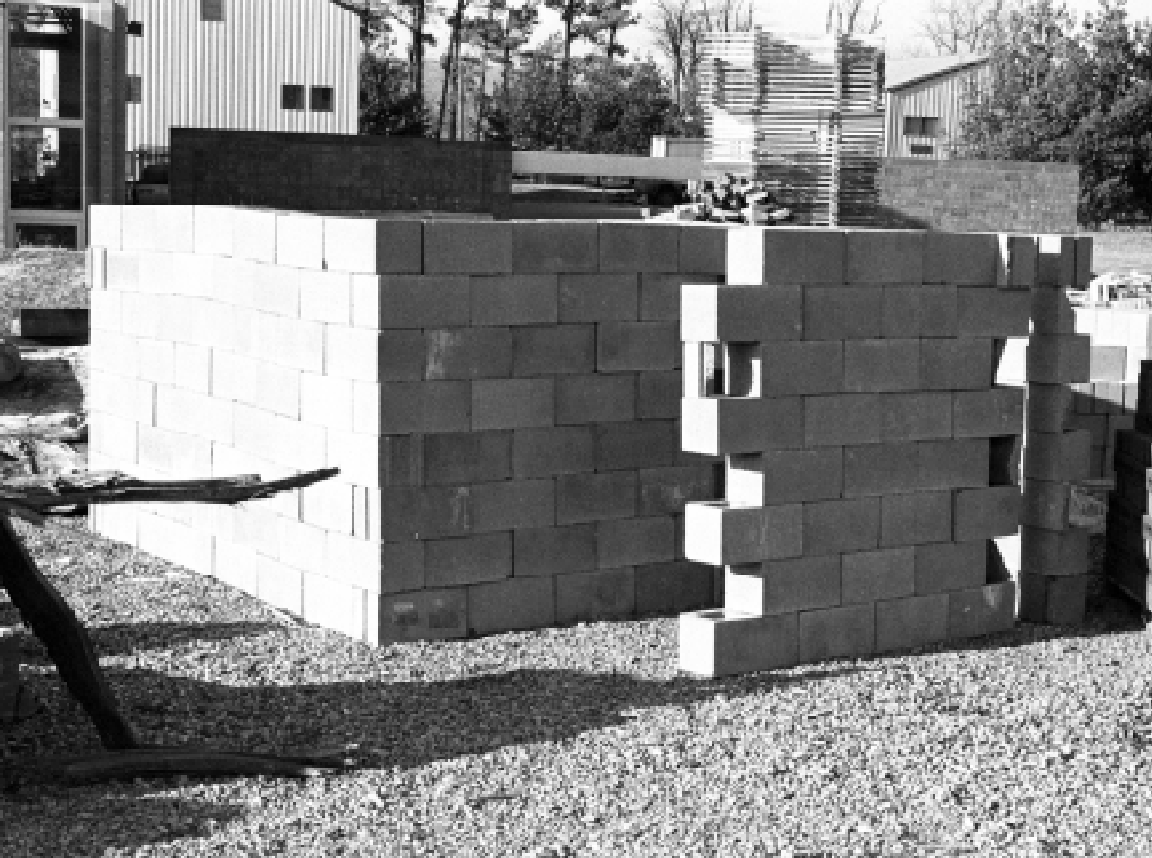
Empiric Experimentation

Early in the project it became evident that a separate smaller room would be needed for individual meditation. How large or how small a room was the question.

After walking off different size areas, I decided that an eight by eight foot room seemed appropriate. I decided to build a room with these dimensions out of dry stacked concrete masonry units. Building a wall around one's self is clearly different than simply staking out a flat area on the ground. The presence of the wall dramatically increased as the room took shape.

This eight by eight foot room was judged to be the correct size. Because the meditation chamber was the very *heart* of the cell, this eight by eight foot dimension was used as a base unit to bring order to the design of the entire cell. Subsequently, the cells were designed using an eight by eight grid in plan with a two foot increment in section due to the material choice of concrete masonry units.







Precedent: Wall as Primary Element

The wall is the primary element of architecture. It does more than simply support a roof. The wall delineates space both horizontally and vertically, and makes a *place* by this delineation. Space is an abstract concept, but the wall transforms an abstract concept into a tangible reality.

The act of building a wall also brings with it a sense of permanence. The mason builds with a hope that the wall will stand straight and true for many years. This sense of permanence gives us a connection to the past and the future. The finite wall helps us to find our way to the infinite.

This process brings order to our world. It is a natural inclination for human beings to bring order out of chaos. I believe this inclination stems from a desire to truly know and understand our world and our place in it. In truly knowing our world we can begin to dwell, and in dwelling truly be at peace.



Background Photo, Left: Richard Serra Sculpture. Background Drawing, Right: Plan of Arnheim Pavilion by Aldo Van Eyck. Inset Photos, Left to Right: House and Studio by Luis Barragan. South Transept, Le Thoronet Abbey. Alcanena House by Eduardo Souto Moura. Mérida Museum of Roman Art by Rafael Moneo. Drinking Trough Fountain at Las Arboledas by Luis Barragan. Arnheim Pavilion by Aldo Van Eyck.

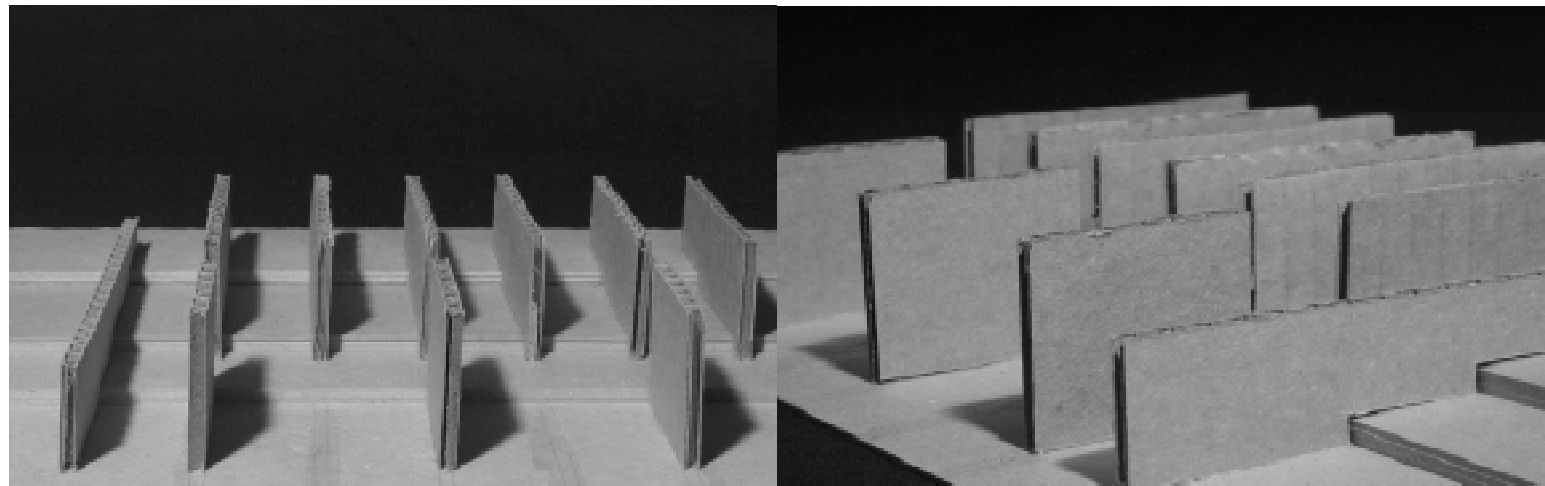
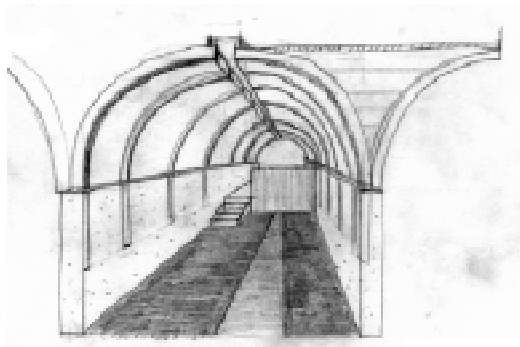
Primary Walls

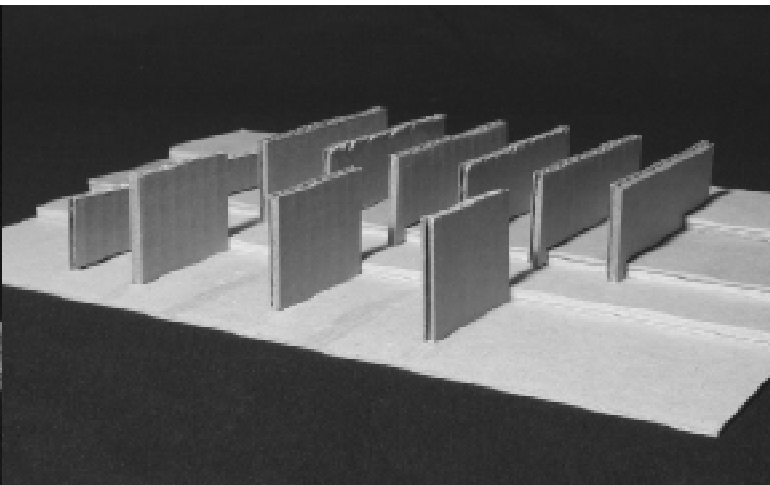
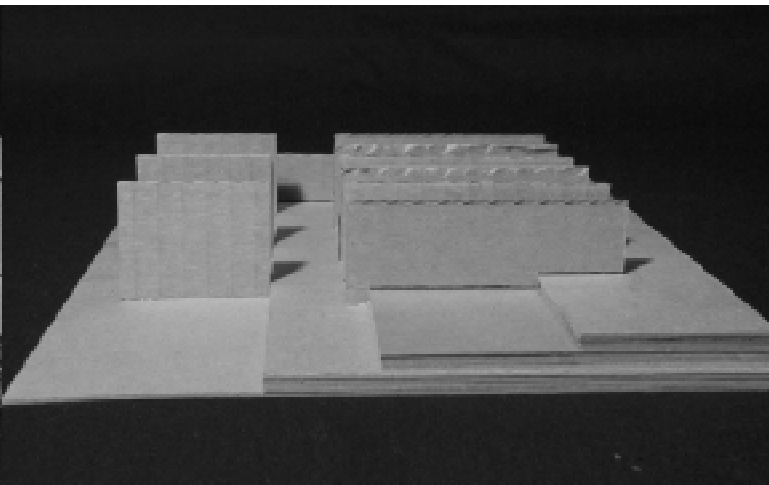
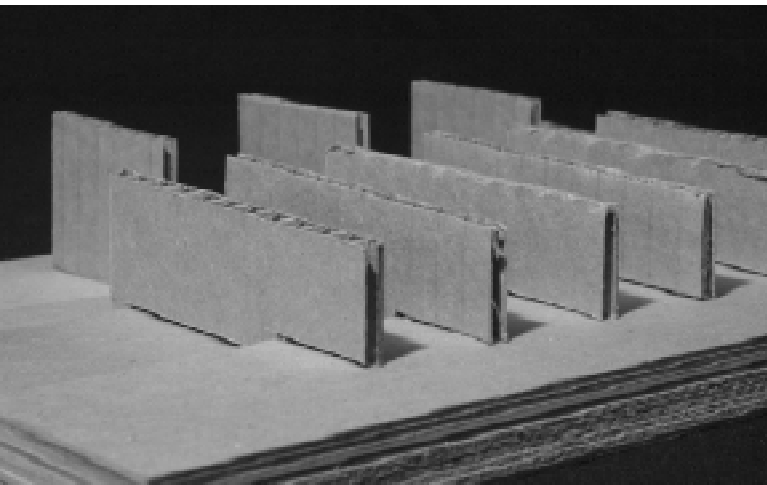
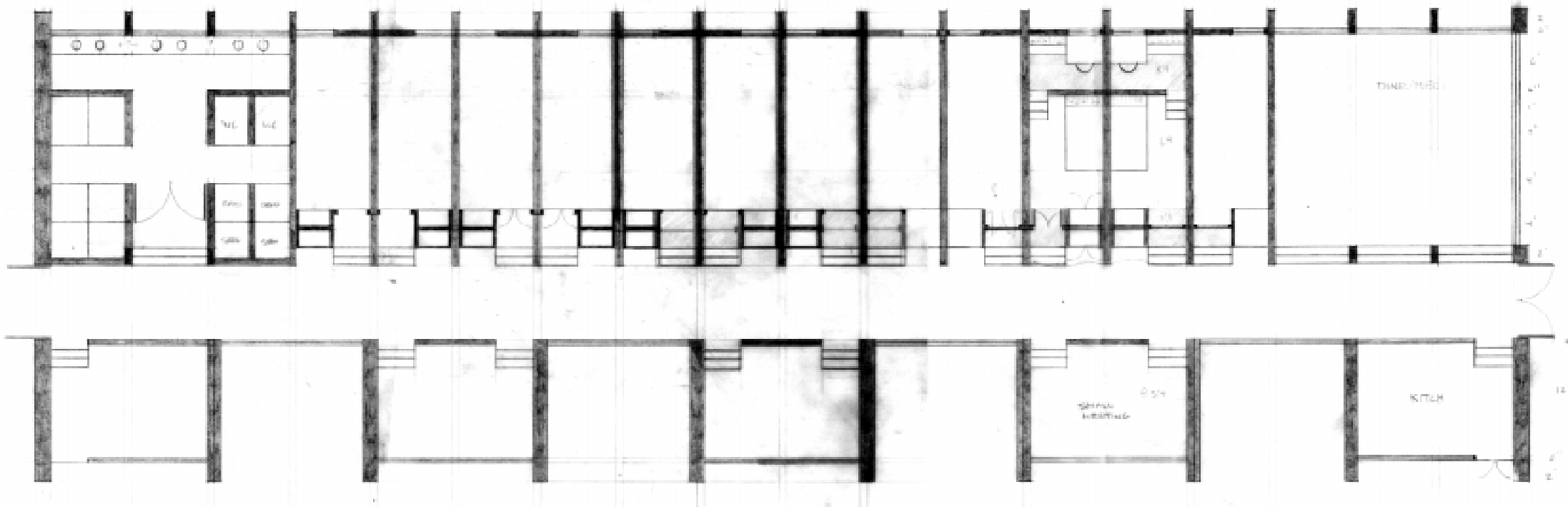
The first studies attempted to establish a hierarchy, direction and rhythm of walls. The premise was that the walls could not be punctured. Entrance to the individual cells was gained through a secondary permeable wall.

In this early plan of the cells, the public and private areas are defined by a dividing corridor, change in rhythm and change in wall thickness.

I began to think about the sloped site in relation to these cells, but at this point it was very abstract. However, this led to the further division of areas by change in floor level.

Initially the ceiling was designed as a series of *ribs* that grew out of the wall with a curved panel stretched between the ribs. This idea was later dropped in favor of a series of beams which maintained the wall's hierarchy.

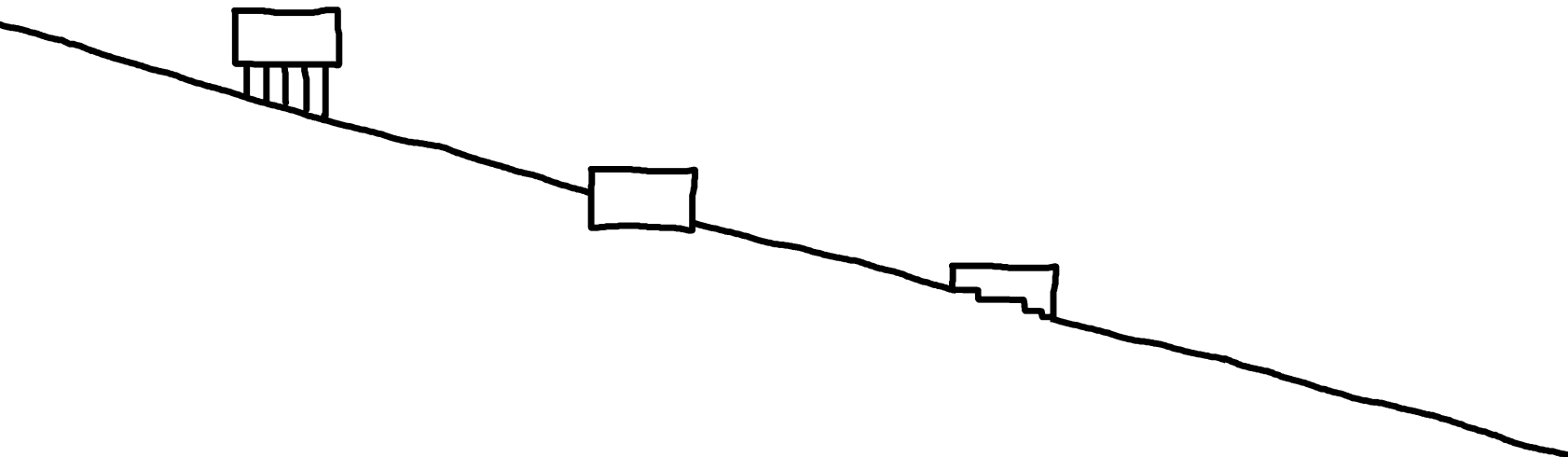






Precedent: Building on a Slope

The architecture of the slope is characterized by three responses to the site. The first strategy is to allow the slope to dominate the design. Piloti raise the architecture above the slope, allowing the land to roll beneath. This allows the architecture to touch lightly on the land and almost float over the terrain. The second and opposite approach is to cut a flat area into the slope, thereby making a distinct place within the slope. The third strategy also cuts into the slope, but steps down in sections. This has the advantage of making several discrete places, while at the same time working with the slope of the land.



Photos, Clockwise from Top Left: Couvent Sainte Marie de la Tourette by Le Corbusier. Halen Housing Estate by Atelier 5. Rokko Housing 1 by Tadao Ando. Collegio del Tridente by Giancarlo De Carlo.

Shifting Walls

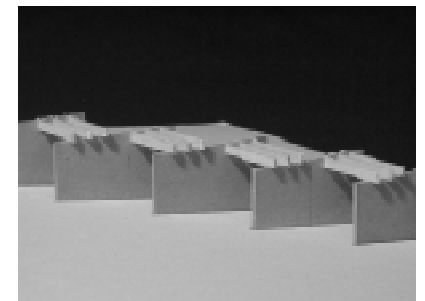
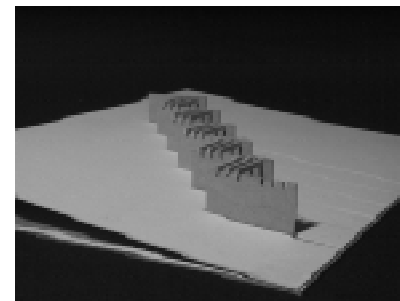
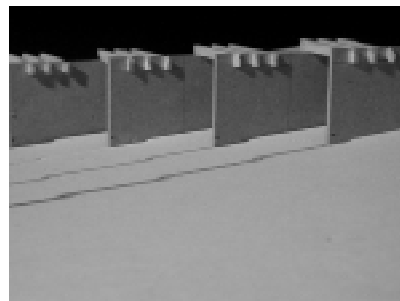
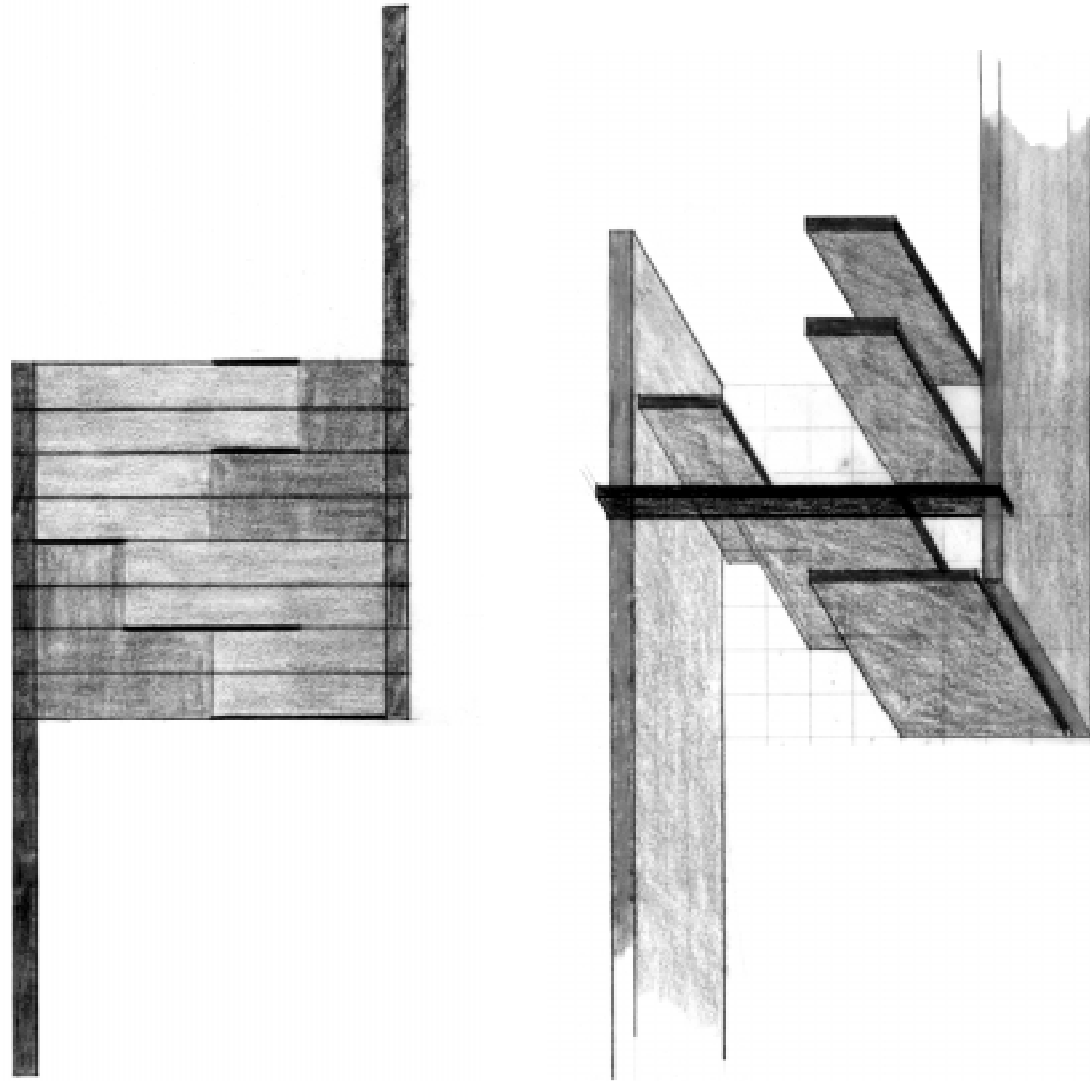
One of the major breakthroughs in the development of the project was the model and drawings at right. By simply shifting the walls, two ideas emerged.

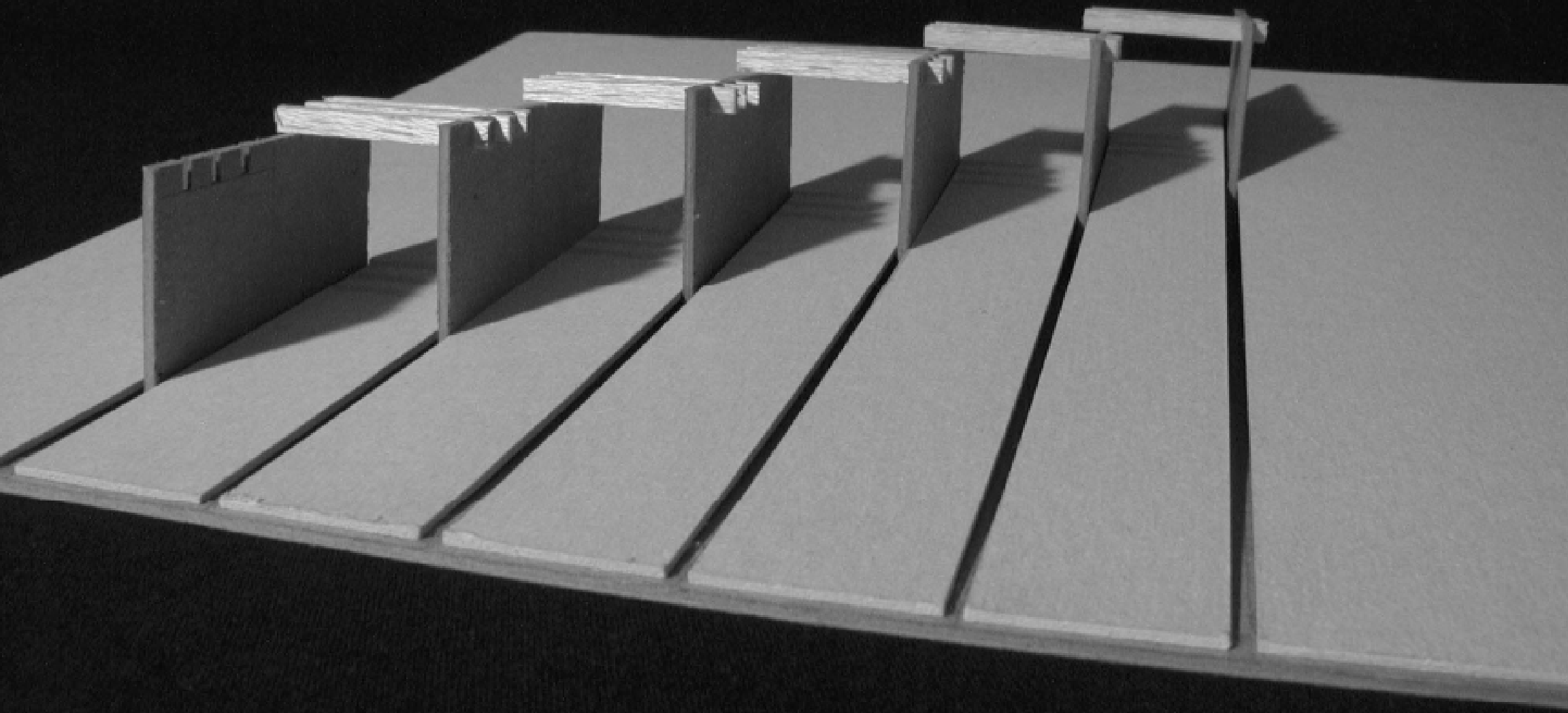
Offsetting the cell walls allowed for more privacy for each individual cell by creating triangular buffer zones at either end of the cell.

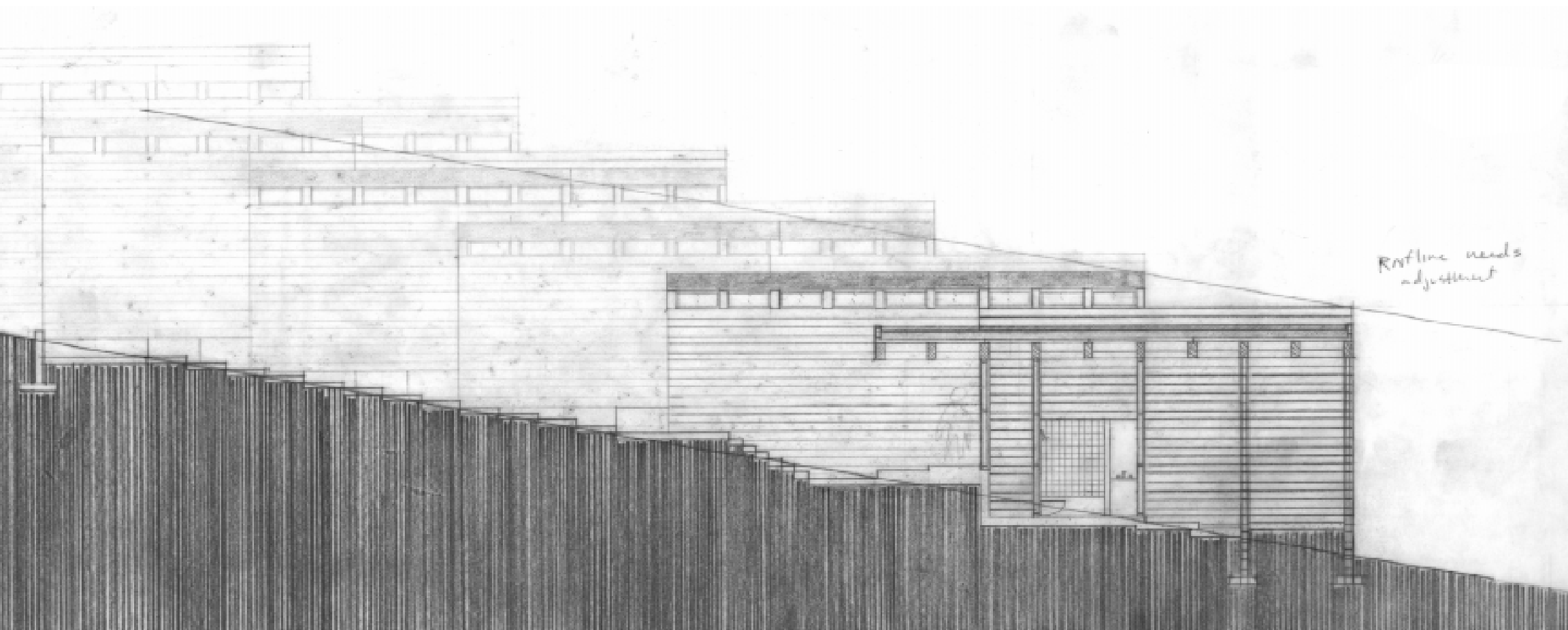
The model reinforced this idea and also led to the development of the rhythm between cell and slope. Because the cell would be located on a consistent slope and the walls shifted a consistent amount, the relationship between a beam placed *within* a wall and *on* a neighboring wall would maintain a constant rhythm.

The project was further defined by thoughts arising from a lecture given by Professor William Galloway of Virginia Tech. He asked a simple question about architecture: "What endures?". This prompted me to ask myself what would be left standing five hundred years from now on this site. I was in effect searching for a source of hierarchy.

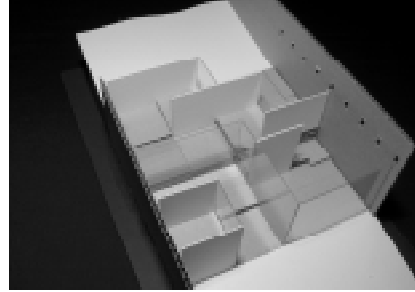
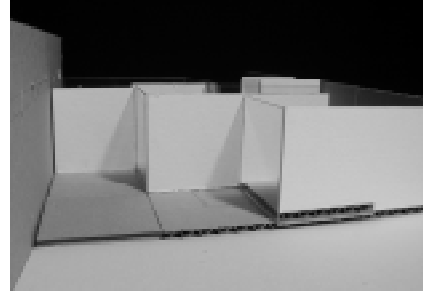
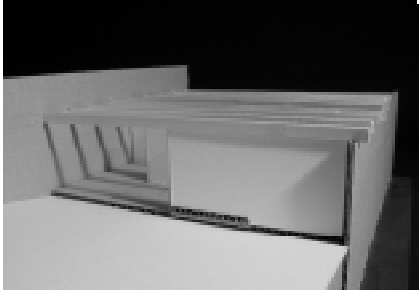
Walls cascading down the hillside became the essence of the project.







Roofline needs adjustment



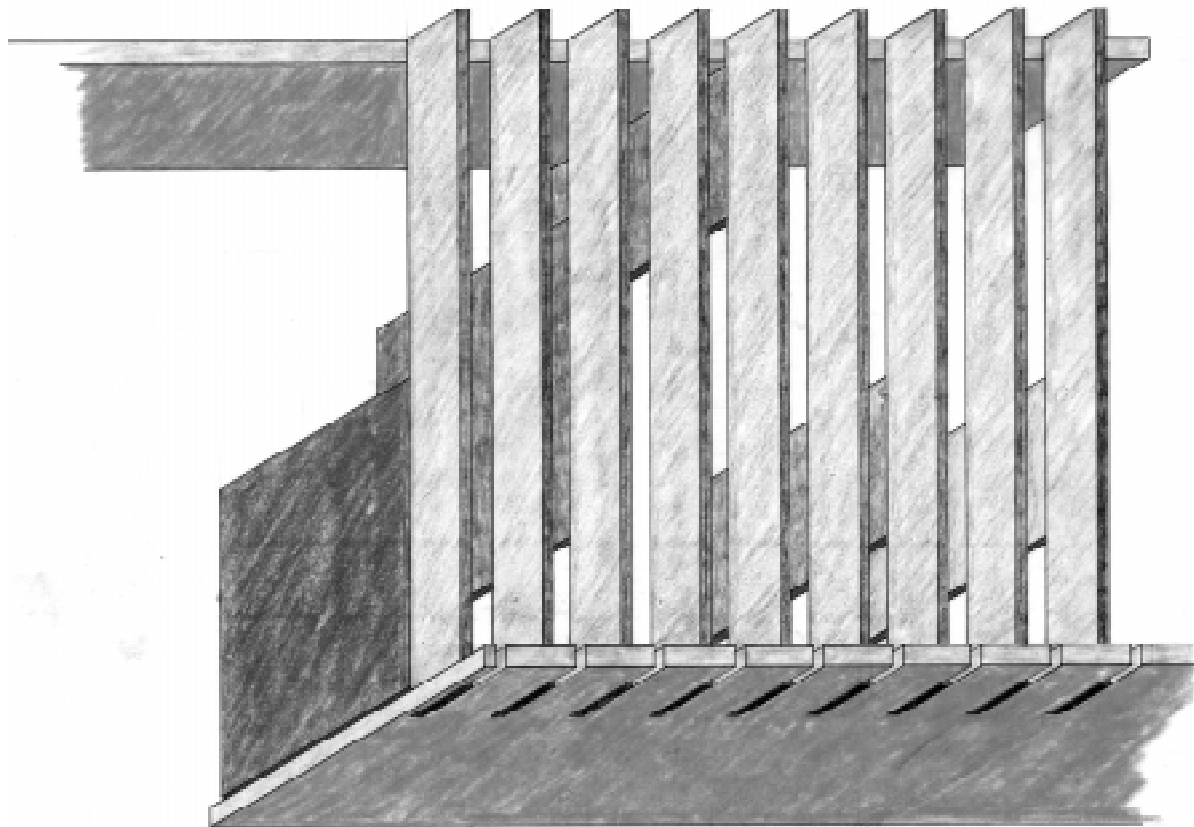
Establishing a Hierarchy

The next step was an investigation into the hierarchy of the primary walls, beams and secondary walls, and their relationship to each other.

The primary walls are thought of as *things* in themselves. (Hard and solid, they were originally conceived of as masonry block and later changed to concrete because of certain material properties that were desired.) They are independent of every other element in the project. They exist outside of architecture in what we might refer to as a “timeless realm”. They are that which endures.

The beams rely on the primary wall rhythm for their placement. The slope is such that for every twenty-four feet of horizontal direction, the hillside descends four feet vertically. This allows for the *within/on* relationship of beams to primary walls.

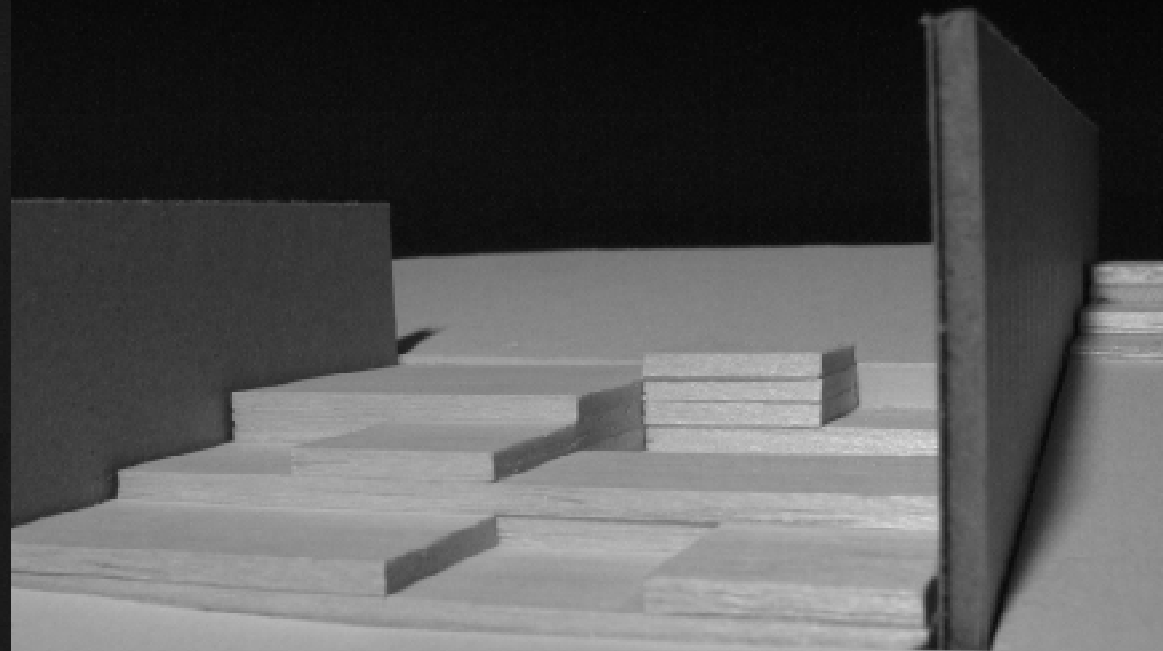
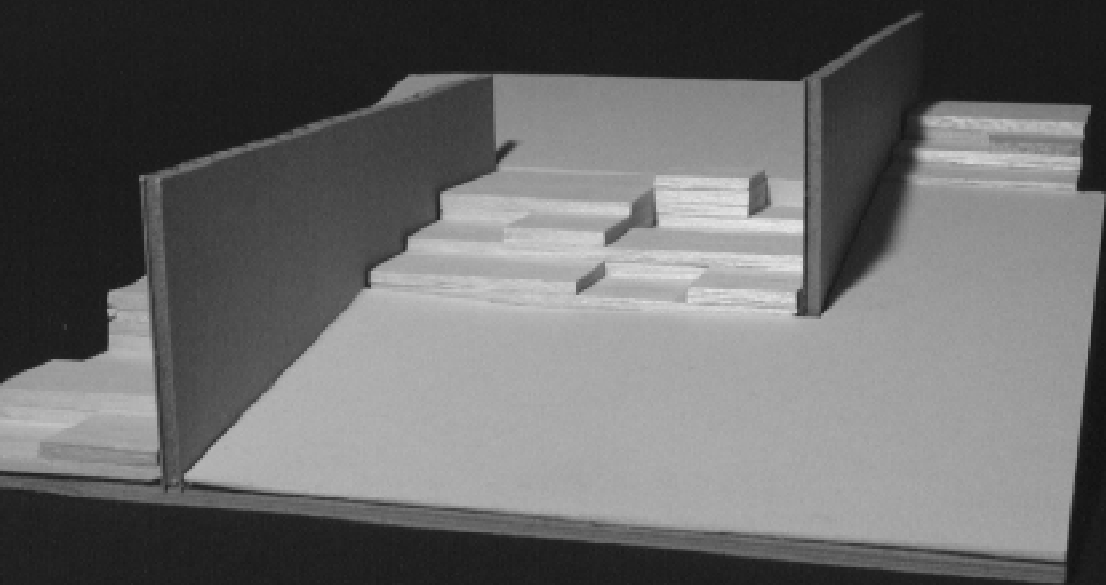
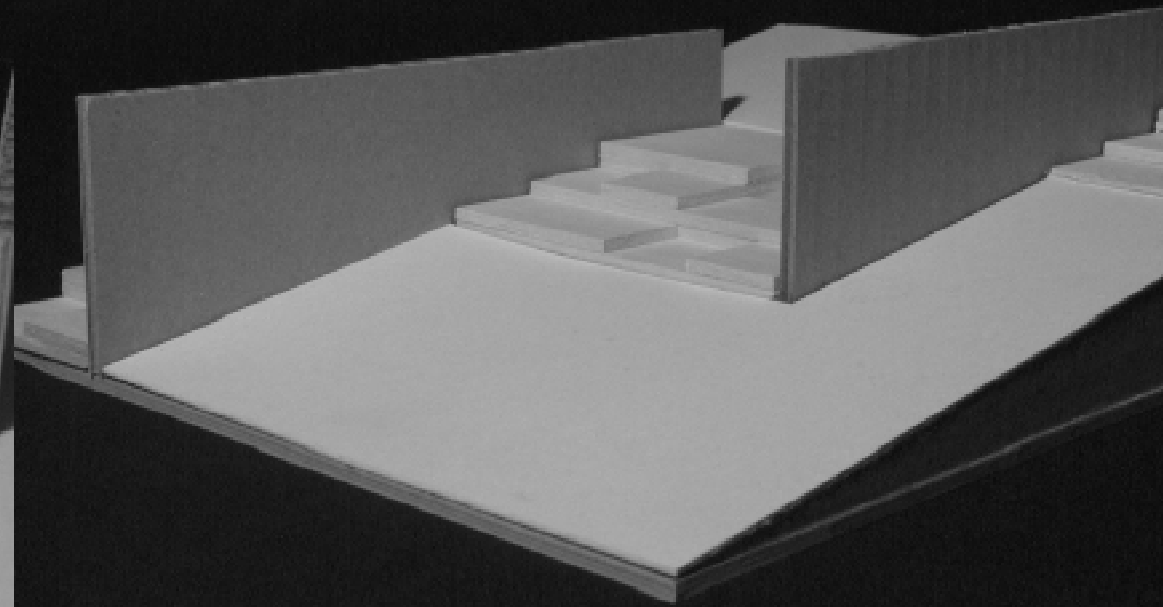
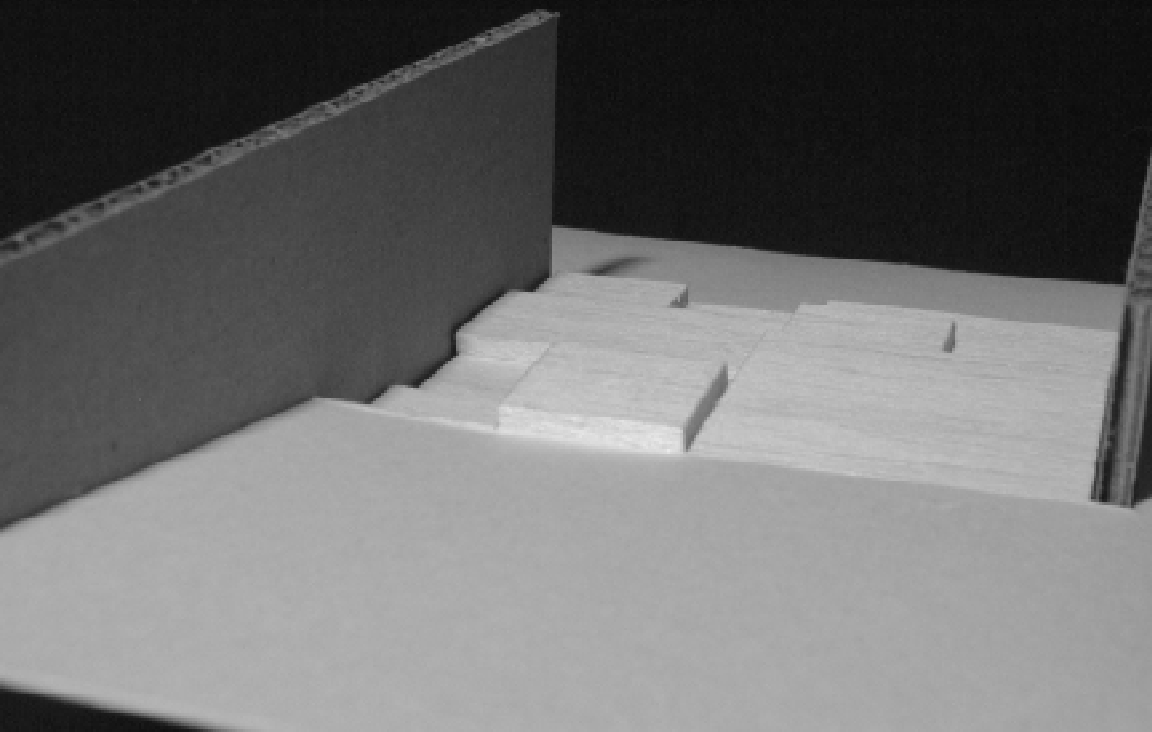
The secondary walls are less permanent, more permeable. The secondary walls form the enclosure of the cell. Made of wood stick construction and framed windows, they are thought of in terms of a skin which wraps around the inhabitant. The placement of these secondary walls actually relies on the rhythm of the beams. They rise from the foundation to the beam, but do not support the beams. Like the primary walls, the wood walls are never punctured. Openings such as windows and doors occur *between* the walls, rather than *through* them.

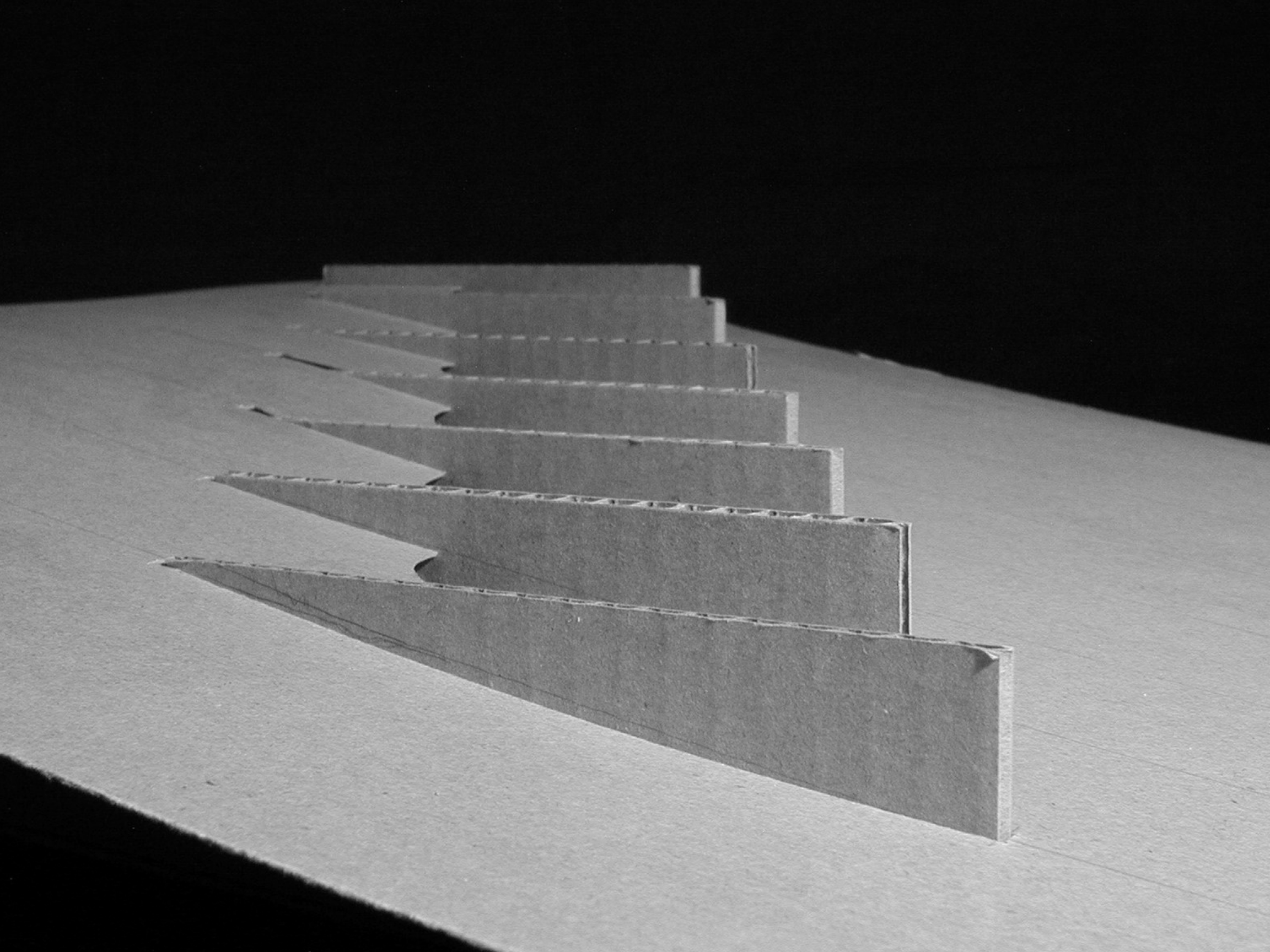


Floor Level Development

The design development for this project proceeded more as a series of overlapping circles than a linear progression. Simultaneous with the development of the structure, I began to explore the relationship of the floor to the earth and the floor to the ceiling. The cell was designed on a grid system laid out on a slope. This left a four foot difference in floor height from the front of the cell to the back.

These models illustrate the search for reconciling this difference by using floor levels to define space.



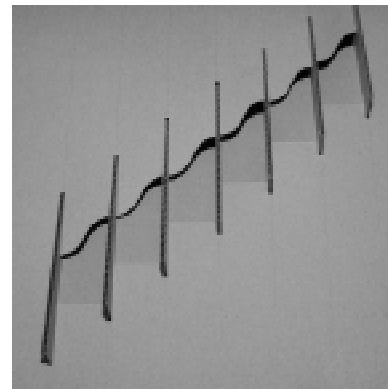
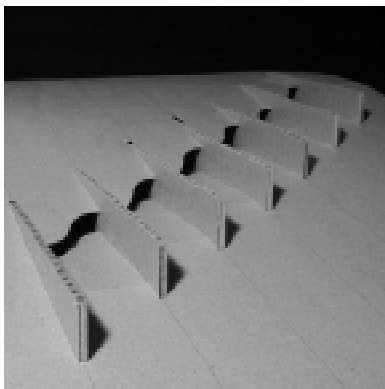
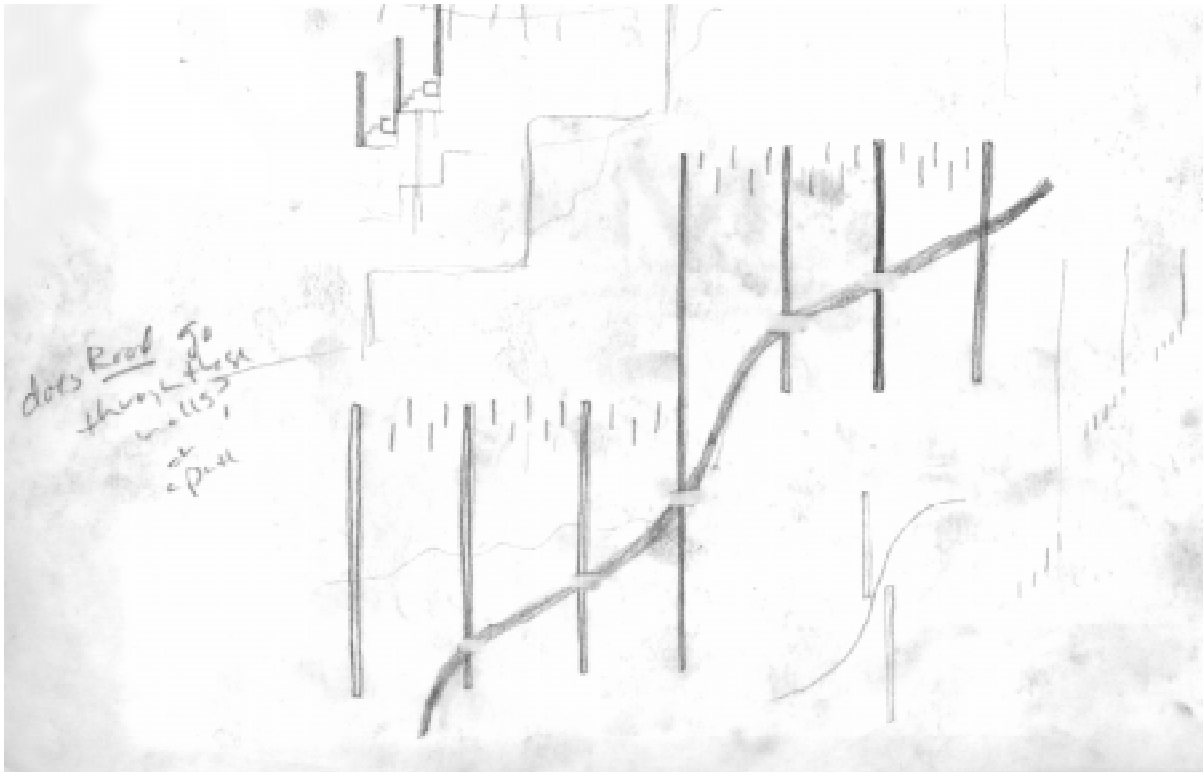


Primary/Retaining Wall Development

The exploration of the relationship between the retaining wall and the primary walls began in drawings. Early drawings describe the retaining wall more as a series of orthogonal lines based on abstract geometry than the reality of the site. The challenge was to maintain the integrity of the primary walls while allowing access through to the individual cells. When the retaining wall became a slow sinuous curve opportunities arose. The curving wall became a route for people to travel through the primary walls to the individual cells.

This use of drawing and model making in tandem allowed for unexpected discoveries. During the process of making of the model (at left) significant developments were made in several areas. The model helped to finalize the rhythm of the sinuous retaining wall. Also, the new retaining wall allowed for a change in elevation of the slope by simply changing height along the curved wall.

More significant, and yet unexpected, was the final development of the primary walls. Previously the primary walls arose out of the slope, the top of the walls far above the sloped ground line. Now, the top of the walls *emerge* from the slope and project horizontally while the slope falls away below.



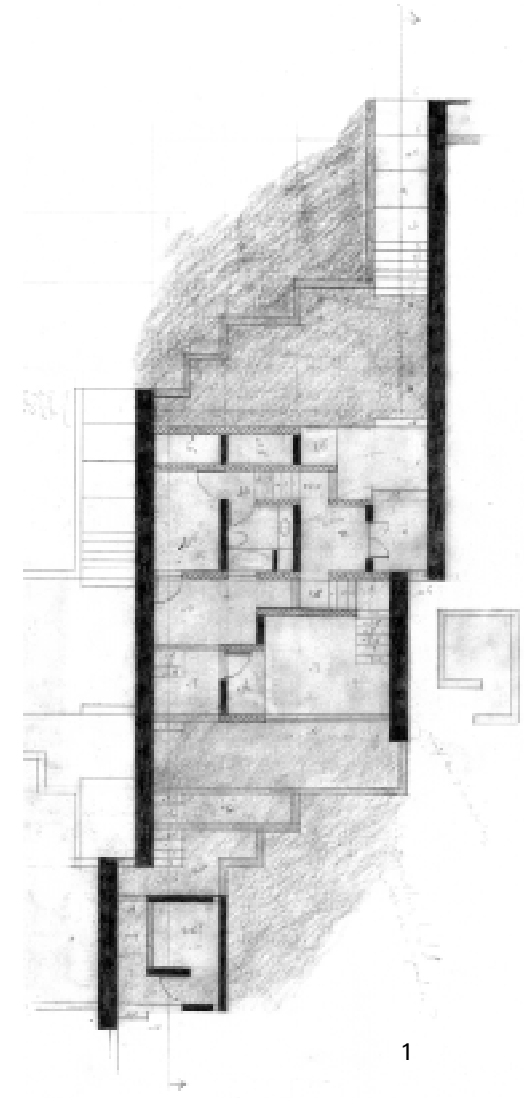
Individual Cell Development

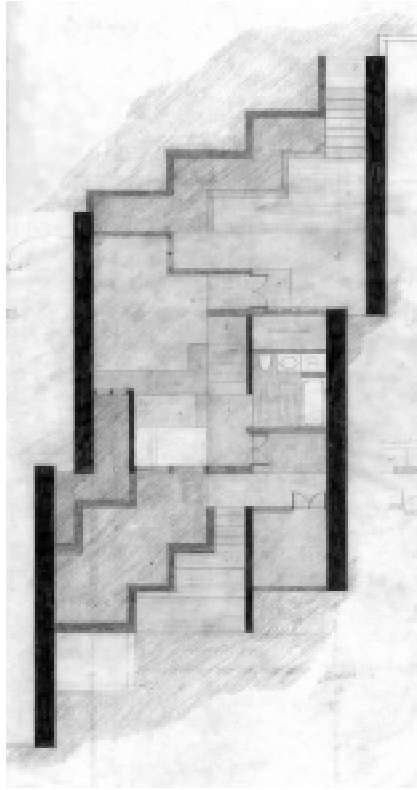
The design development of the cell was a process of refinement. The plans shown here represent significant moments in this process. In the first plan, the primary walls have been separated and shifted to allow for a glimpse of the countryside that lies beyond the front courtyard of the cell. The interior division of the cells has gone from diagrammatic simplicity to a overcomplicated functional disharmony. The meditation chamber has been removed from the cell entirely, and placed as a separate building within proximity of the primary walls and cell. The retaining walls derived from the geometry of the grid are not fully developed.

In the second plan the retaining walls have been simplified. The interior has also been simplified but allows for all daily activities. The meditation chamber has been moved in closer proximity to the cell, with a primary wall forming one of the chamber walls. Access to the cell is still thought of as a walk straight up the hill to a path perpendicular to the primary walls.

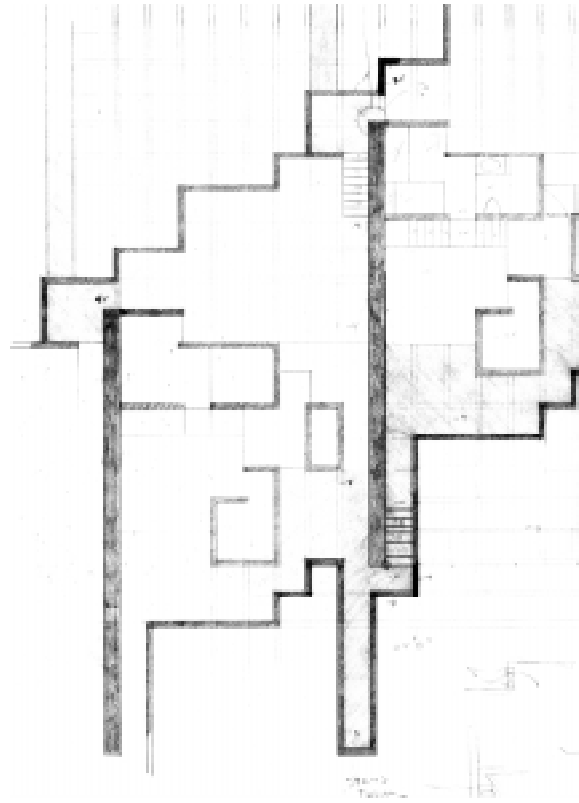
The third plan shows an attempt to combine the path through the cells with the placement of retaining walls. The meditation chamber has been integrated into the cell. It is a separate structure from the skin of the cell, but remains covered by a common roof. The monolithic nature of the primary walls has been reasserted. The view to the distant countryside is maintained by providing a space between what will become the mechanical closet and the uphill primary wall. This opening also provides access to a thin strip of retained earth jutting out over the slope.

In the final plan, this idea of the horizontal datum is finalized in the wooden dock which runs along the downhill primary wall. The primary walls now emerge from the ground and run horizontally as the slope descends. To accommodate this change, the primary walls have become longer. The retaining walls have also changed, now a sinuous curve which holds back the earth as well as providing a path through the flight of cells.

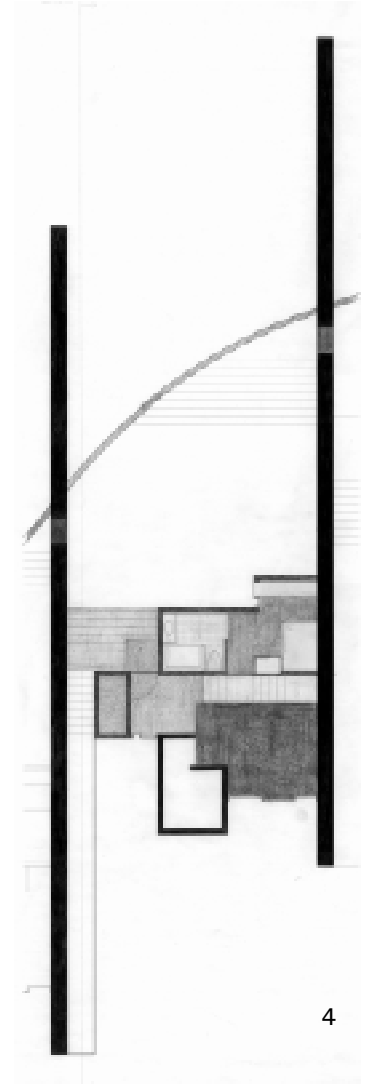




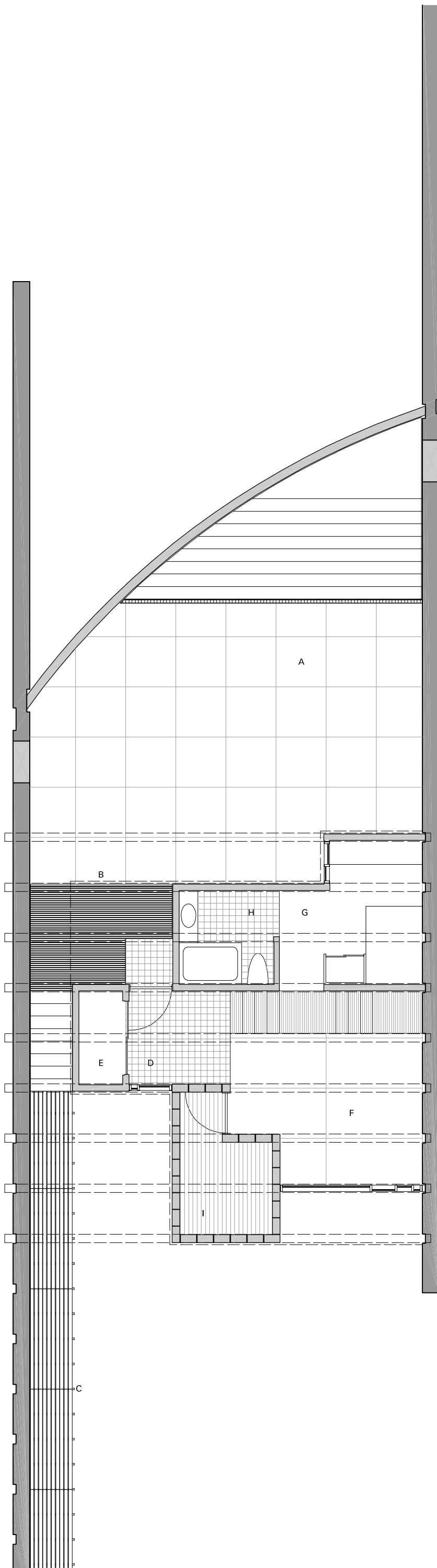
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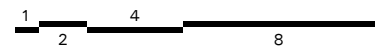


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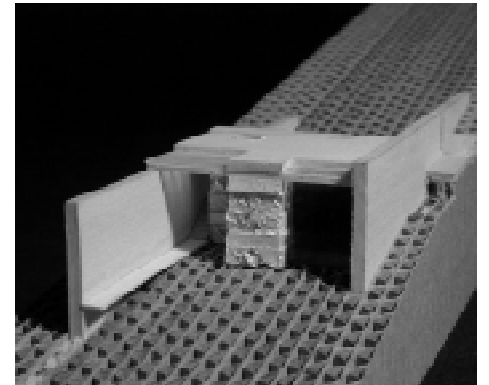
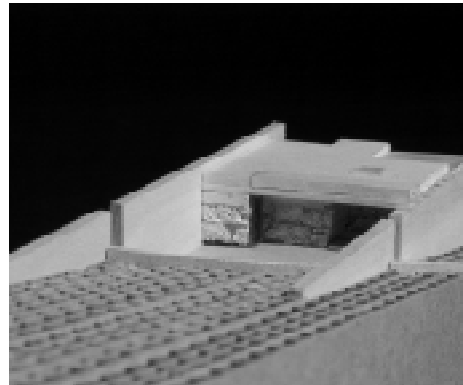
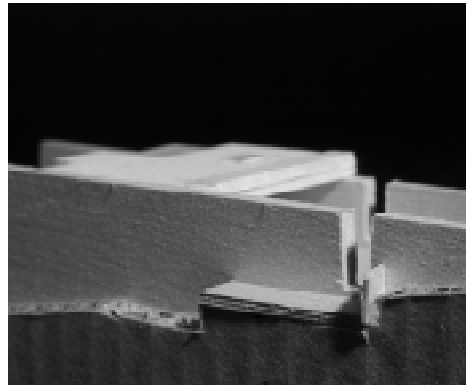
Individual Cell Plan

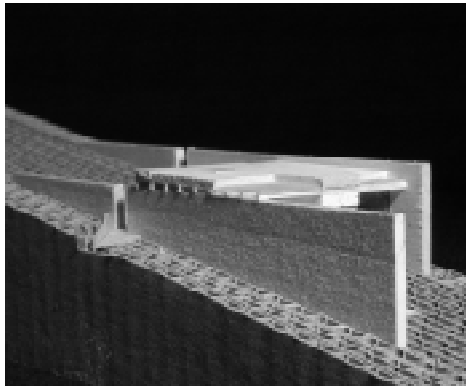
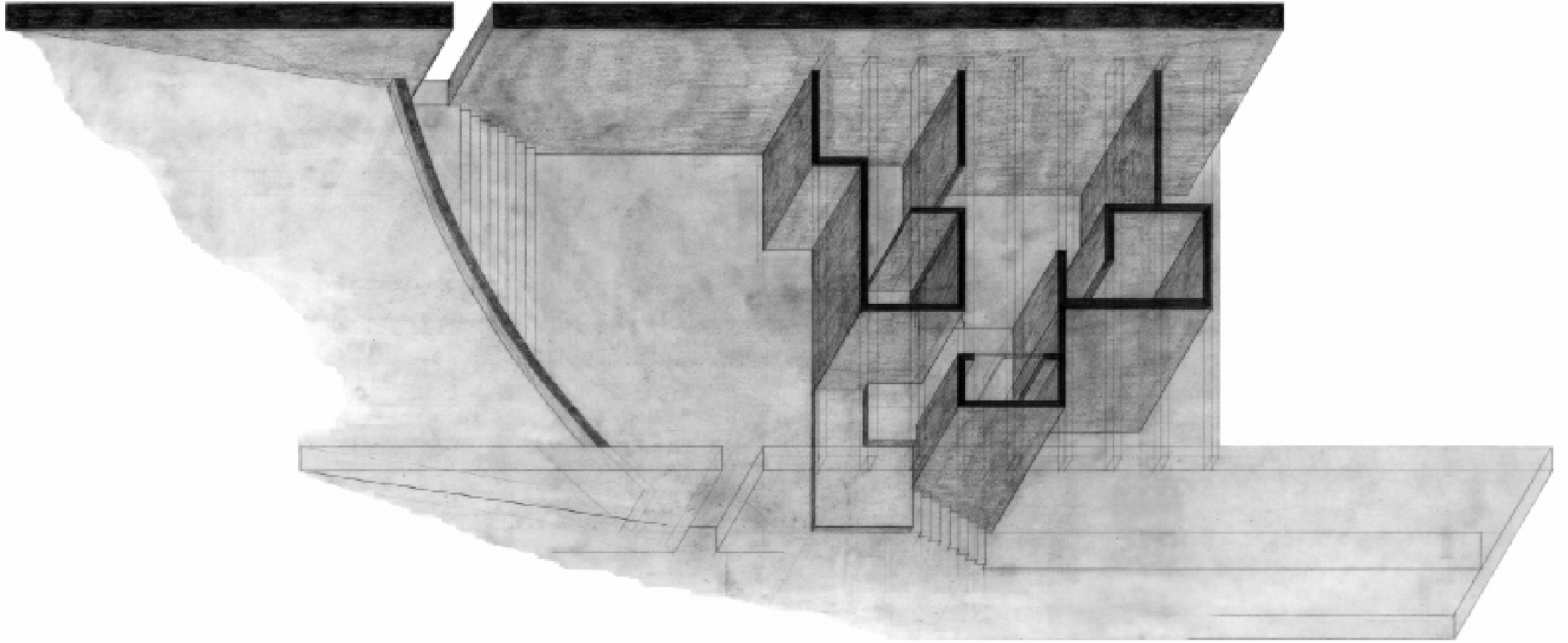
- Legend:
- A Courtyard
 - B Deck
 - C Dock
 - D Foyer
 - E Closet/Mechanical Closet
 - F Living Room
 - G Bedroom
 - H Bathroom
 - I Meditation Chamber

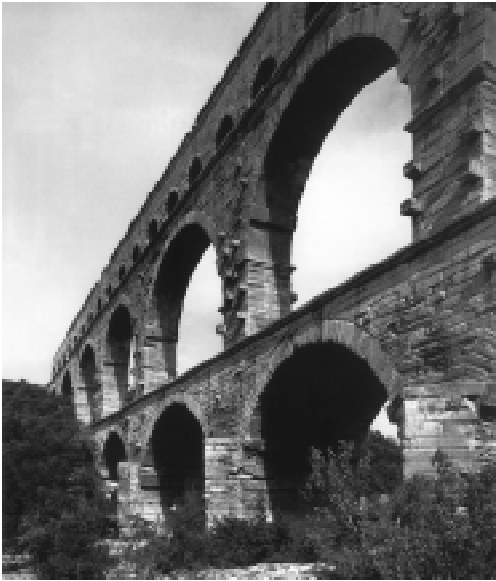


Beyond Order: Harmony

Once again the tandem use of drawing and model making began the search for harmony of material, position and place. In this model and drawing the elements of hill, primary walls, retaining wall, beams and secondary walls begin to form a cohesive whole. These discoveries led to the realization that in order to understand one cell, one must be able to understand the group of cells in its entirety.







Precedent: Rhythm and Order

One of the ways in which we seek to establish order is through rhythm. The repeated rhythm of a building's primary hierarchical element can strengthen the building's overall order.

For example, the Pont du Gard and Dulles Airport use a primary structural element repeated at a constant rhythm. This constant rhythm brings an easily recognizable order to the structure as a whole.

In a similar manner, the exterior facade elements of the Secondary School at Morbio Infiore by Mario Botta repeat in a regular rhythm. This regular rhythm is carried through on the interior, but is offset so that what appears to be a break between two units on the outside is in fact one whole interior unit.

This use of contrasting rhythms can help to differentiate the building's elements and clarify our understanding of those various elements in relation to the entire structure.

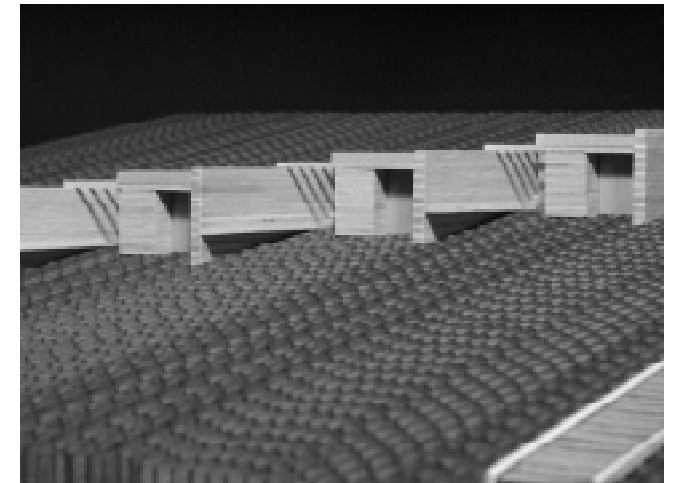
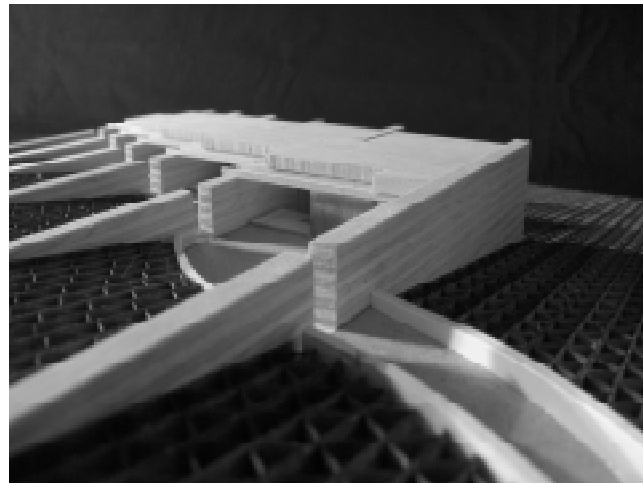
Jefferson employed this technique on The Lawn at the University of Virginia mainly through a change in scale. The covered walkways employ Doric columns spaced, for the most part, at regular intervals. Different architectural orders are used in the Pavilions, however, with different corresponding column rhythms. In addition, the scale of the Pavilions is far greater than the simple walkways. This change in rhythm and scale help to differentiate the covered walkways from the Pavilions, while at the same time help to establish the overall order of the *Academical Village*.

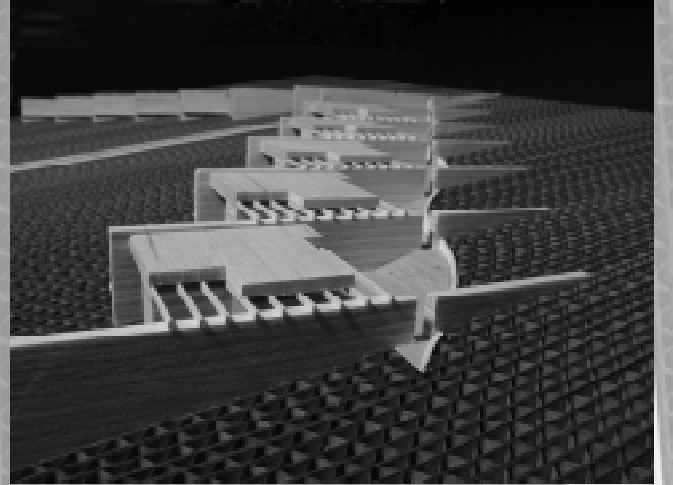
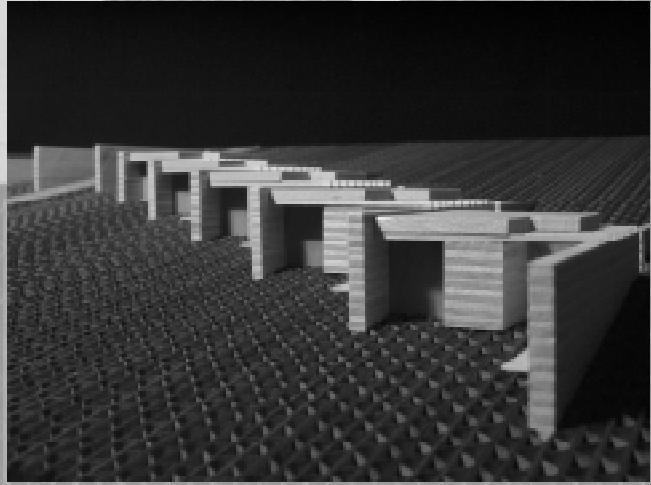
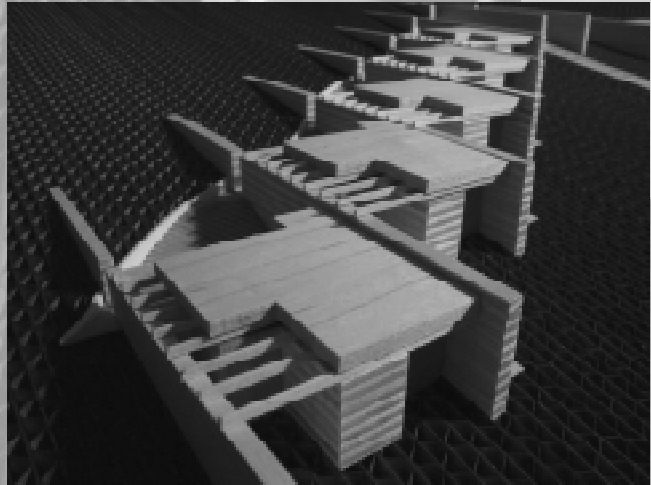
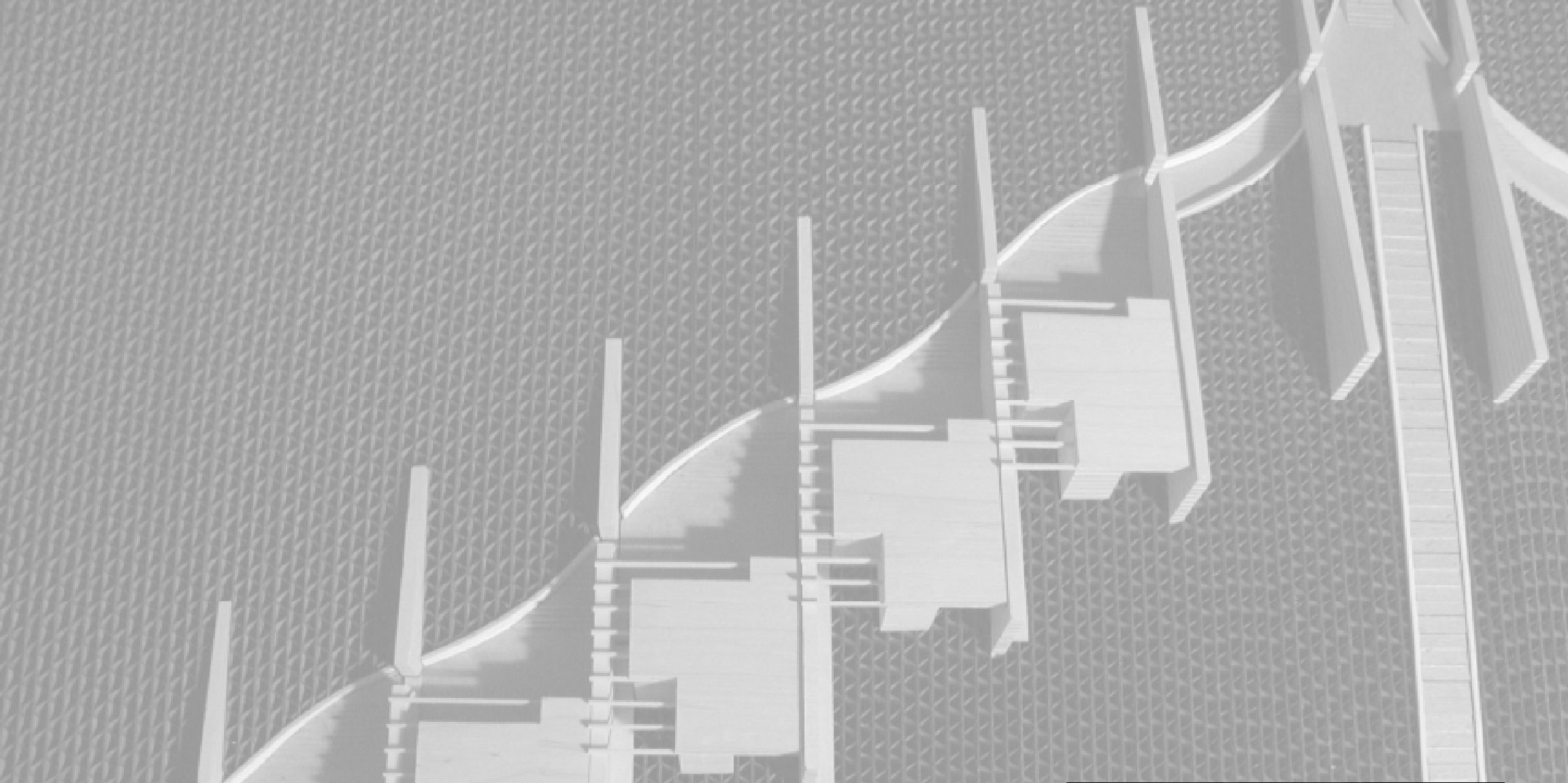


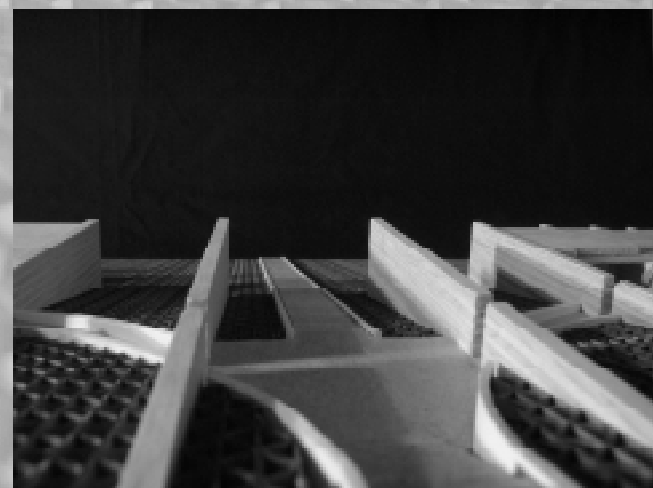
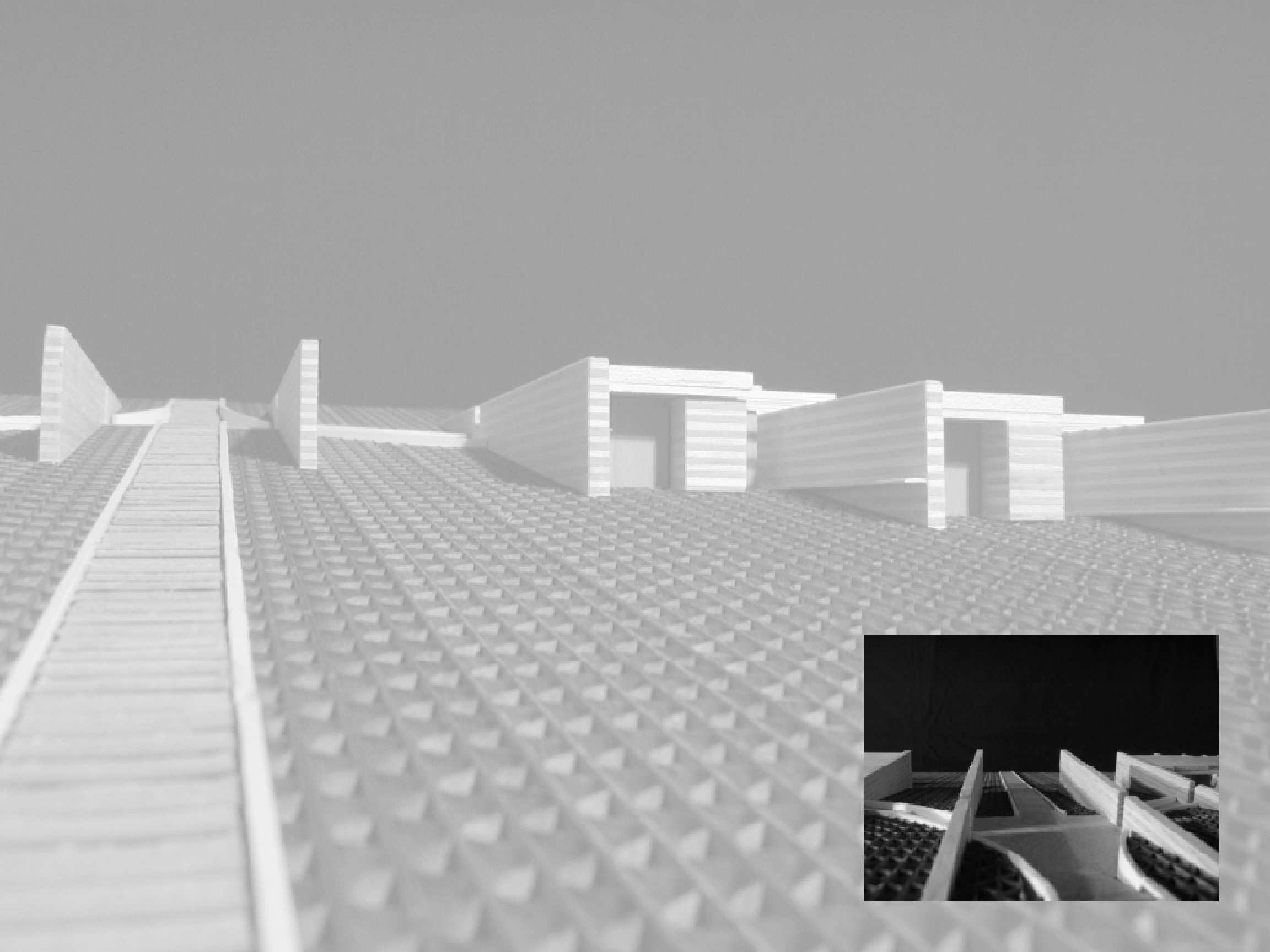
Rhythm as Unifier

The individual cell was ordered using an eight by eight foot grid. The ordering of the group or *flight* of cells was established through the use of distinct repetitive rhythms in the primary walls and sinuous retaining walls.

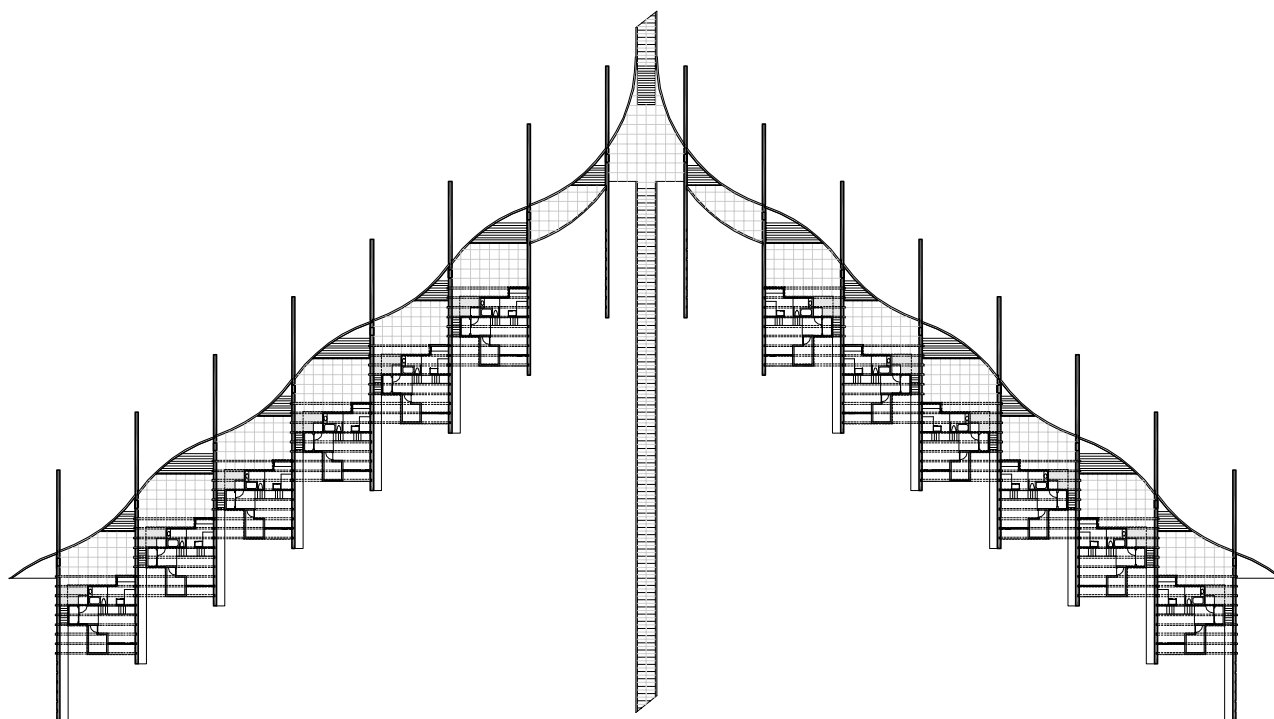
These simple rhythms contrast to the constant slope of the hillside, creating distinct places which become part of the landscape.





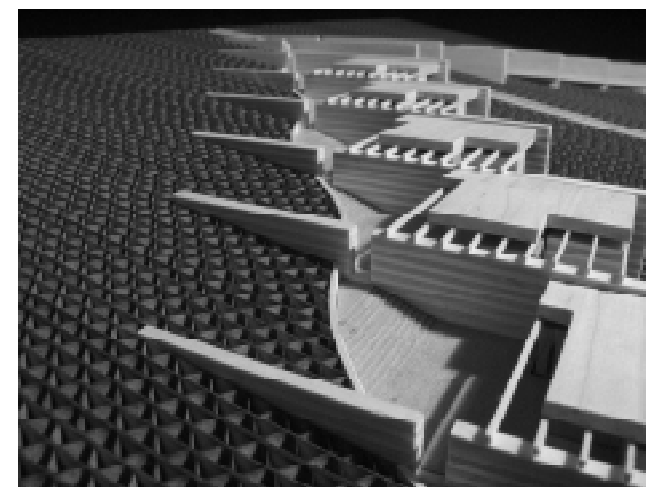
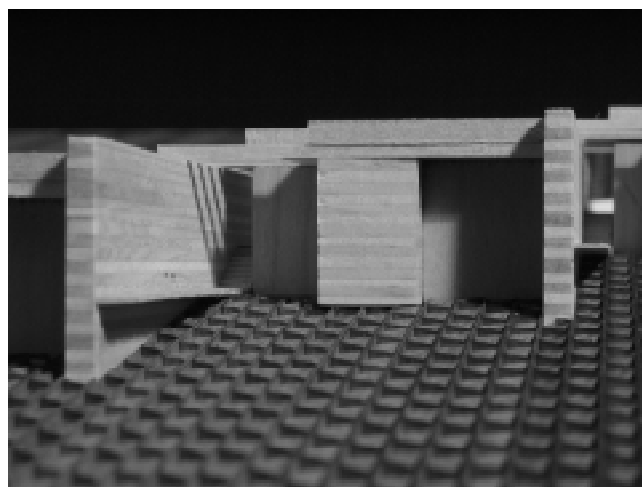
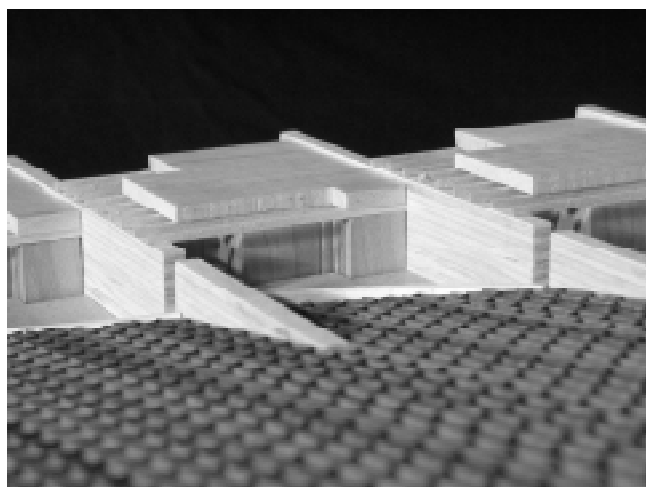


Axial Reflection



The rhythm of the cells is clearly evident in plan. The cells are further unified by reflection along a central axis. This *flight* of cells becomes a whole in itself, yet allows for the introduction of additional *flights* along the major axis.

This spine serves as the main path up and down the hill, and contrasts to the sinuous path through the individual cells. While the primary walls cascade straight down the hill, the retaining walls weave a course through the walls. One walks along this curving path and steps through the primary walls to continue to the next cell.

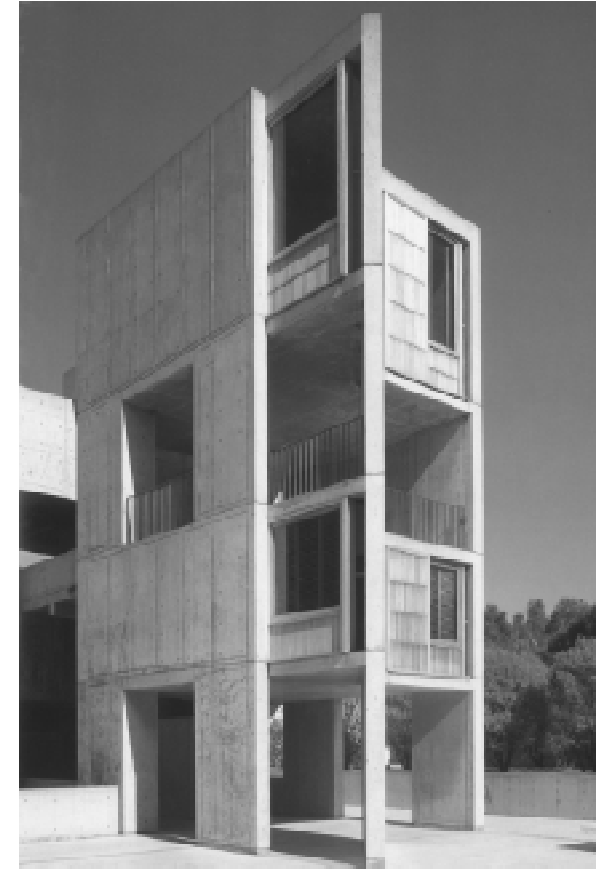


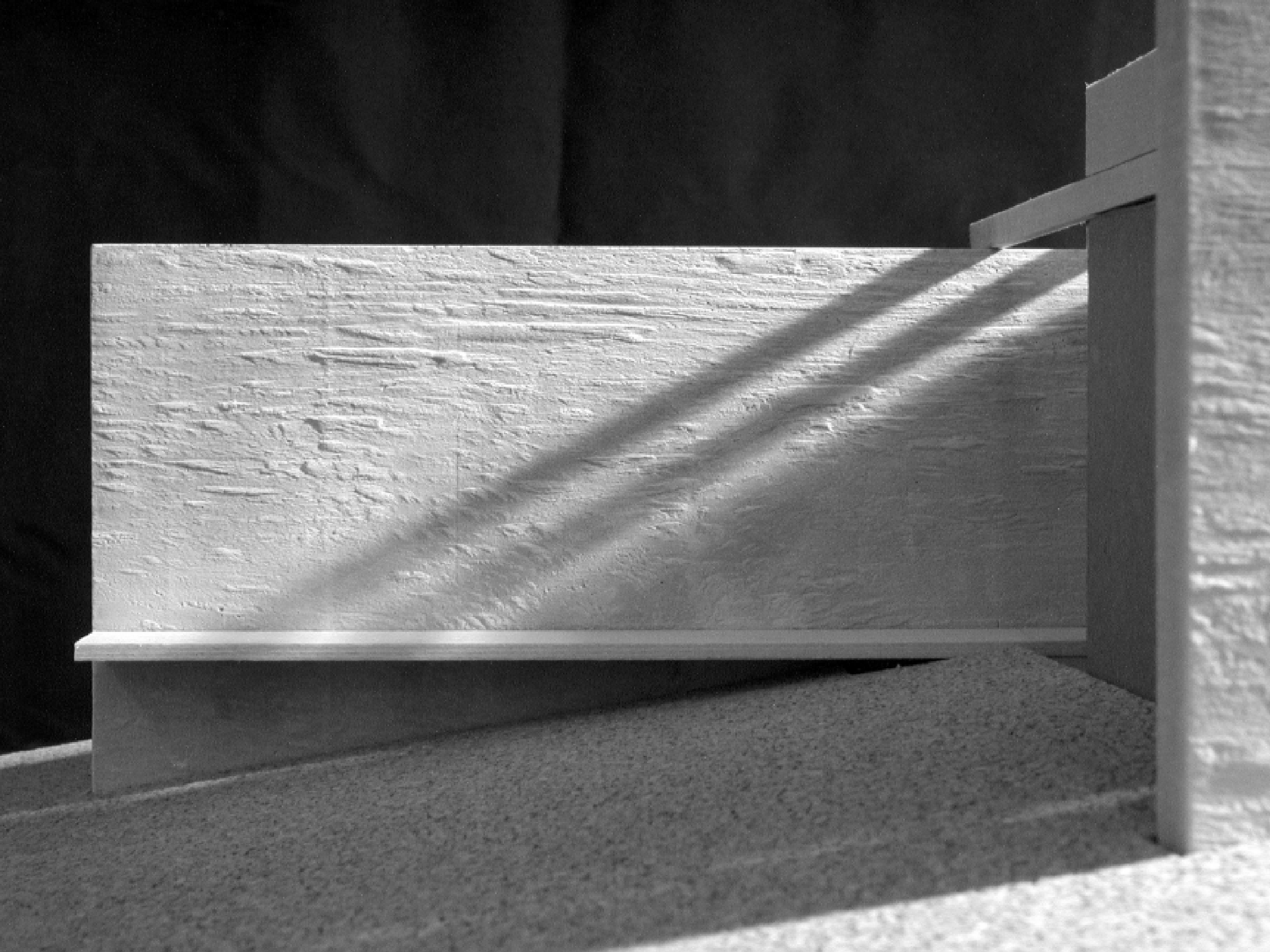
Precedent: Use of Material

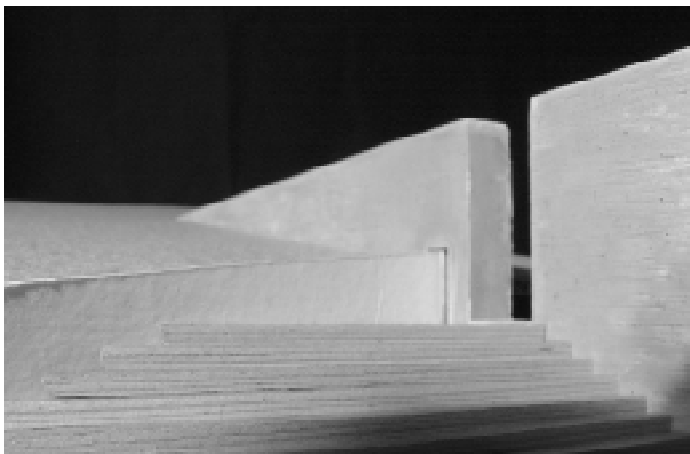
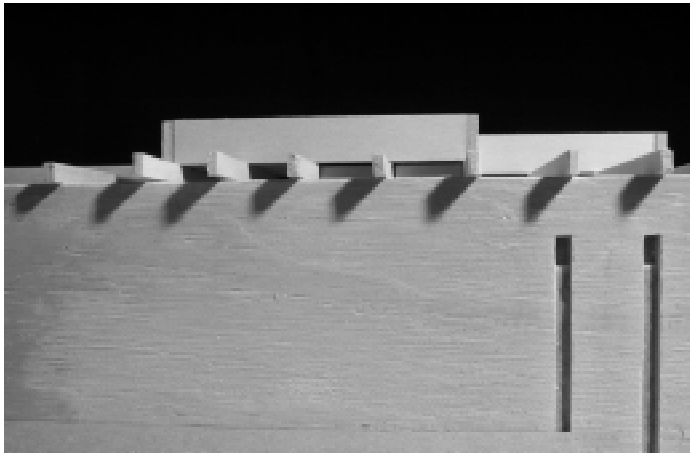
The design process is directly tied to the careful consideration of the materials used in construction. The nature of the material considered affects decisions in both the designed idea and the designed reality. Rather than limit the architect's imagination, the choice of a specific material helps bring an abstract idea to a tangible reality. A wood framed wall has very different qualities than one sheathed in marble, or cast in concrete. Each material present lends specific tactile, visual and meaningful qualities which enhance the formation of *space* into *place*.

The successful integration of contrasting materials can enhance this formation of place and elevate the entire design to a harmonic whole.









Material

Concrete, wood, masonry block and glass. The materials for this project are chosen with an eye to the senses and weathering. The change of seasons and passage of time change the materials and consequently one's sensory relationship to the material.

The primary walls, retaining walls and courtyard stairs are concrete. Concrete was chosen because of its dual nature; massive and solid when cured, yet plastic when forming the necessary shape. Slightly coarse and uneven, the textured surface catches the morning and afternoon light.

The wood laminated beams are laid four feet on center and support a three inch thick wooden roof deck. The roof deck is laid across the beams and together the beams and deck form the interior ceiling surface. The contrast between beams exposed to weather and those protected within the confines of the cell will gradually reveal the passage of time.

The wood framed secondary walls are sheathed in two inch wide Douglas fir vertical siding while the glass windows are framed in two by six inch wood mullions. Together these walls and windows form the *skin* of the cell. Both materials smooth to the touch, they provide a counterpoint to the concrete.

Lastly, the meditation chamber is built of concrete masonry units. Concrete block offers some similar characteristics of poured concrete such as mass and a specific tactile nature, yet its size and construction method speak to the human being's presence in the making. More permanent than the skin of the cell, the chamber is still not as substantial as the primary walls.

Arrival

The individual cell exists as part of a larger group or *flight*. The primary concrete walls cascade down the grassy hillside, while the sinuous retaining wall *appears* to flow through the primary walls. This retaining wall also provides a path to move through the primary walls, proceeding from cell to cell via the stairs and courtyards. In fact, the opening in the primary wall at the top of the courtyard stair is the only place where the mass of the wall is allowed to be entirely removed.

Descending the stairs, one enters a small courtyard. This space belongs to the cell but also acts as a buffer between the privacy of the cell and the need for a public path along the edge of the courtyard. Once you cross the courtyard you step up onto a small covered deck. To the right is a small flight of wooden steps leading down to a wooden *dock* which juts out horizontally over the grassy slope in much the same way that a pier reaches out to meet the ocean. It is at the same time a datum for the horizontal and another possible place of contemplation.

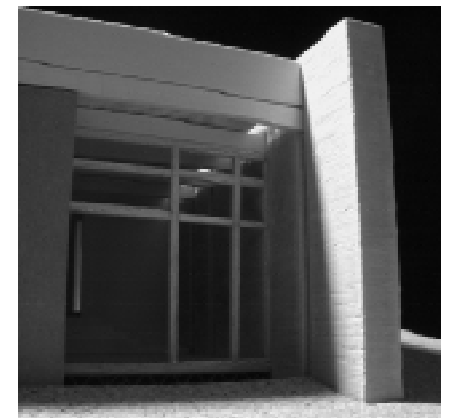
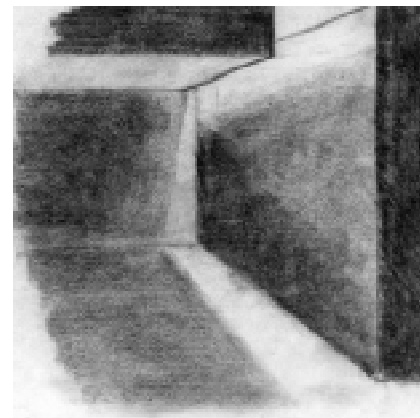
Remaining on the deck, you notice the tiled threshold step and front door to your left. The tile continues from this step into the interior foyer. Moving through the cell's doorway, you enter the foyer. There is a closet to the right, a window in front of you, and a flight of stairs to the left. From this vantage point you can see the view out the back of the cell and also the interior view of the living room below.

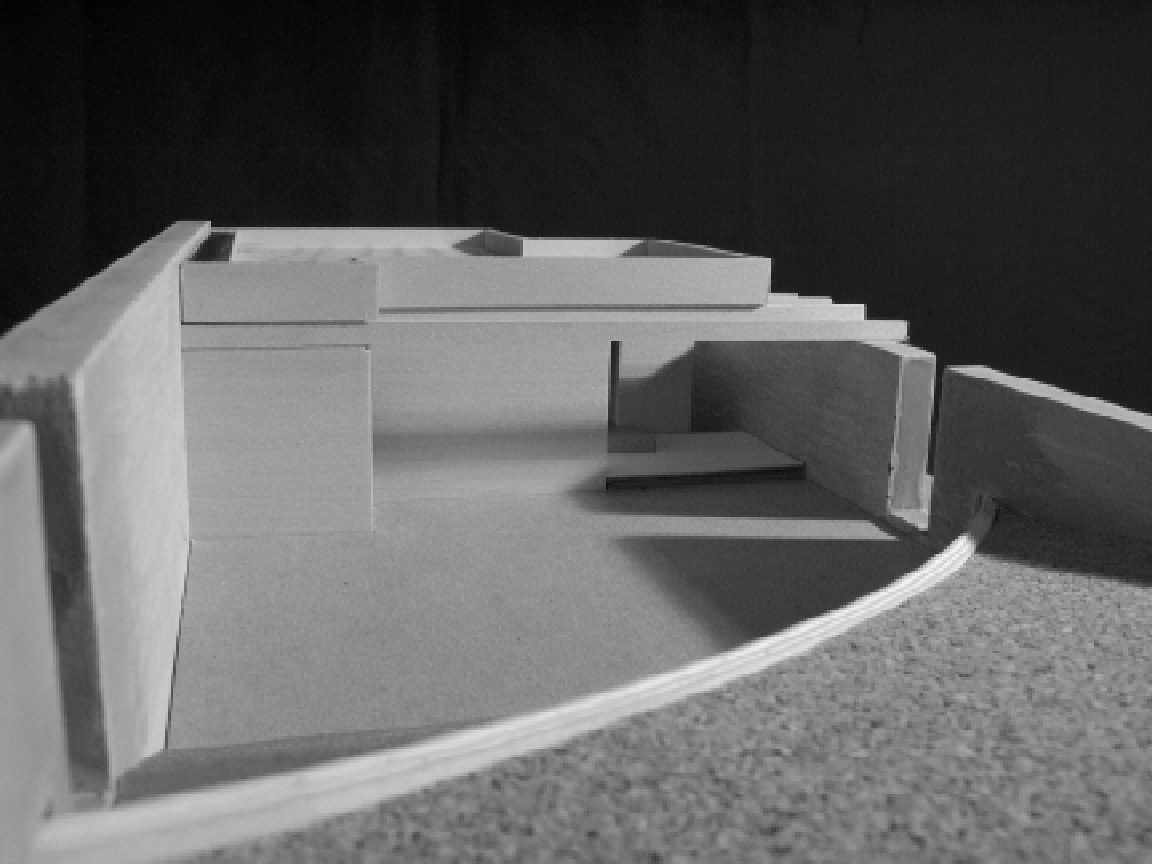
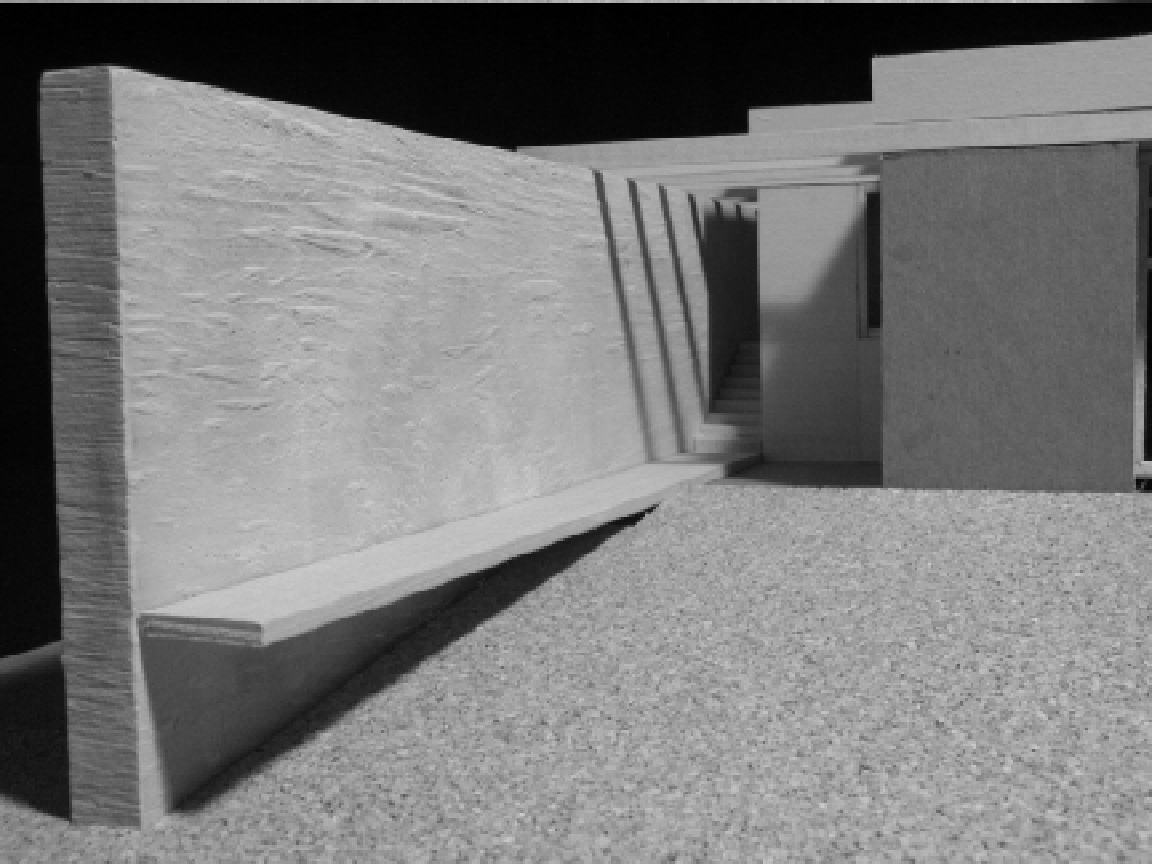
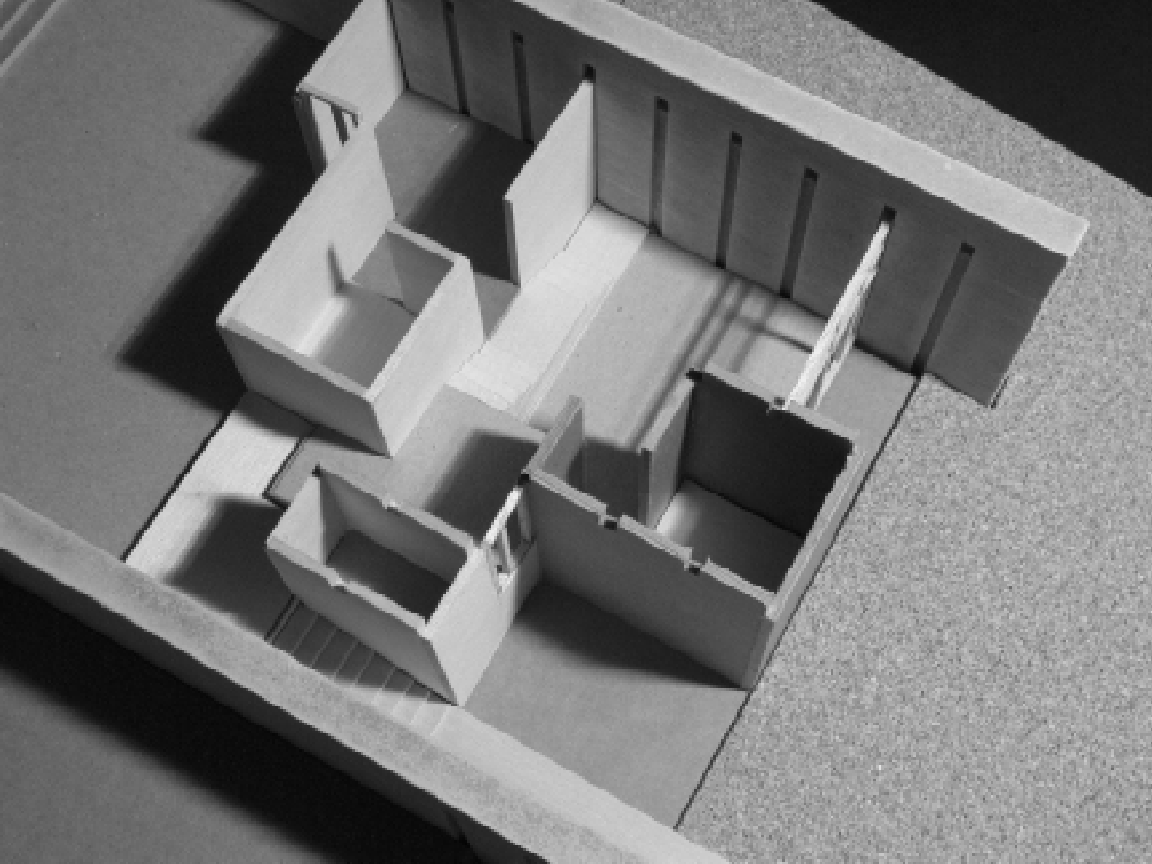
The concrete wall across the room is marked with the rhythm of vertical grooves formed in the wall. Light from above catches the texture of the wall and forms shadows in the

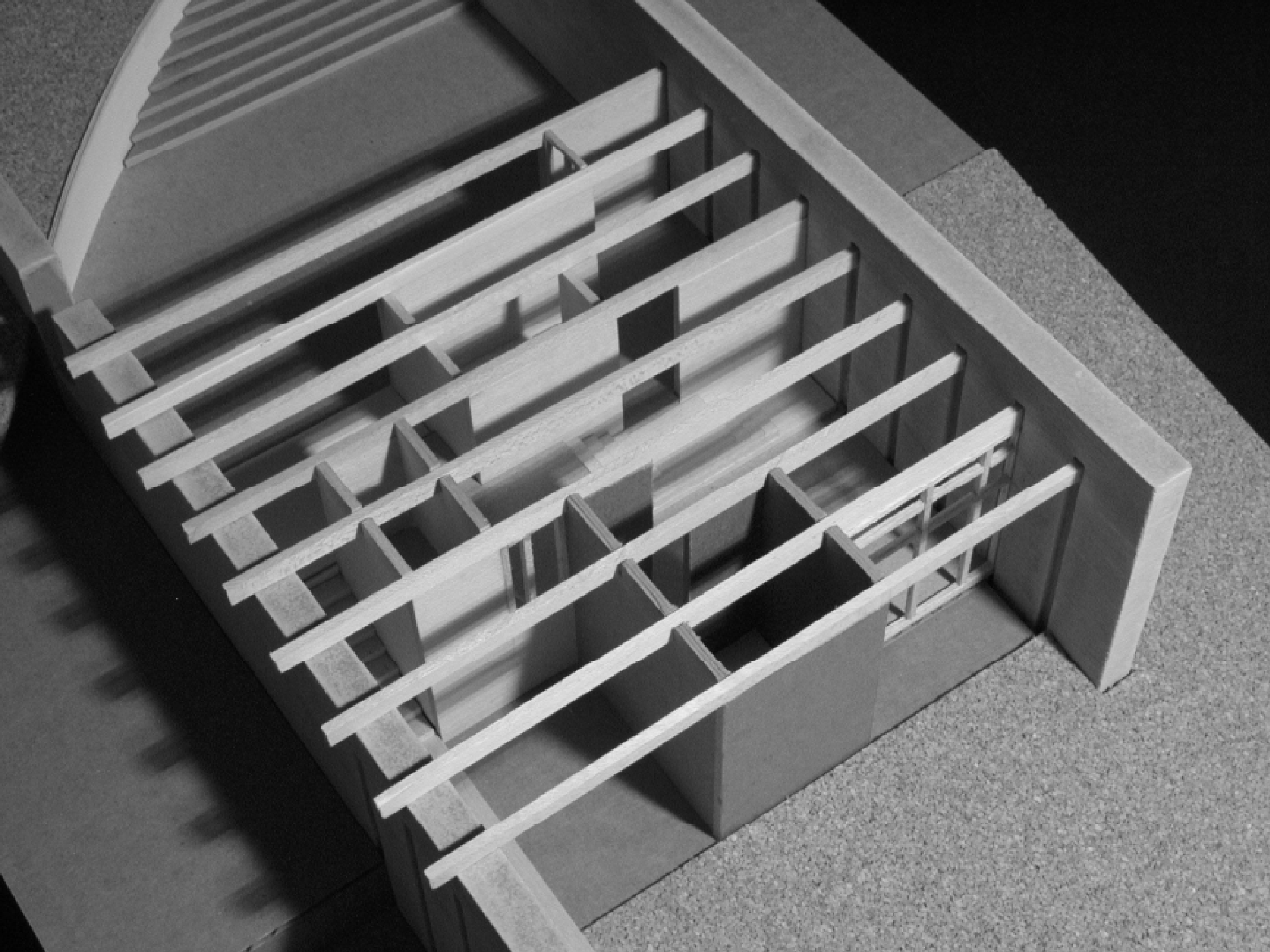
grooves. These grooves coincide with the placement of beams set into this same primary wall. The beams extend overhead, past the cell's perimeter wall and sit on top of the opposite primary concrete wall.

Proceeding down the stairs to your left you stop at a small landing. The bedroom is one step up from the landing, with an additional step up to the bath. Continuing down the main stairway, you enter the living room, with a mullion patterned window wall opposite. This window wall provides different framed views of the distant countryside. Moving across the living room's concrete floor you enter the most private space of the cell, the meditation chamber.

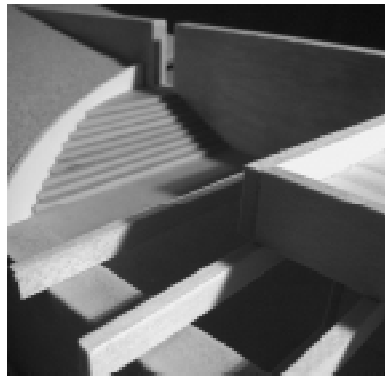
Entering the meditation chamber, you step up on to a hardwood floor. The main part of the room is eight by eight foot wide by twelve feet high. The room is entirely composed of concrete block with the overhead beams moving through the walls. Light enters through an interior window above the doorway and can be regulated by shutters or artificial lighting within the chamber. It is here where one finds the end and the beginning of the journey.







The individual cell begins with two primary walls set approximately thirty-two feet apart and offset twenty-four feet in the longitudinal direction. These walls emerge from the hillside and project out horizontally while the landscape falls away below.



The curved retaining wall holds back the slope and allows a level place to form the concrete surfaced courtyard and cell. The retaining wall appears to puncture the primary walls but does not. A groove is allowed to form in the primary wall to accept the retaining wall. The hierarchy is always evident because it is clear that the primary wall *allows* the groove to be formed as an act of generosity.

Similarly, a series of grooves and pockets are formed in one side of the primary walls to accept the laminated beams and secondary wood walls. These nine inch wide grooves bring a rhythm and texture to the cell's interior which contrasts to the other interior surfaces. The eight by sixteen inch laminated wood beams sit *within* one primary wall and sit *upon* the opposite primary wall. Within the pocket, the beam sits on a half inch thick metal plate with a half inch of clearance between the beam and the surrounding pocket edge. On the other end, the beam is raised off the top of the opposite primary wall by a half inch thick projection of concrete, and extends eight inches past the edge of the wall. The beam's responsibility is to support the wood decking, insulation and EPDM membrane of the low slope roof assembly. A wood framed knee wall defines the edge of the roof. The roof follows the perimeter of the cell with

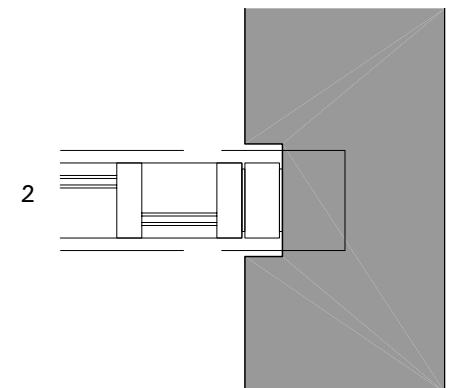
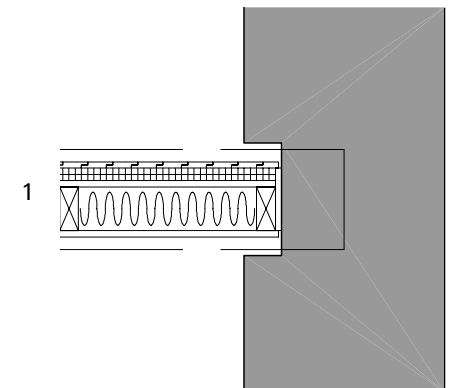
additional coverage over most of the front deck and back window wall. A skylight located where the ceiling meets the uphill primary wall washes light down over the beams where they enter the wall.

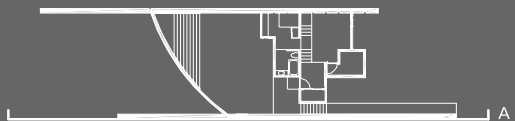
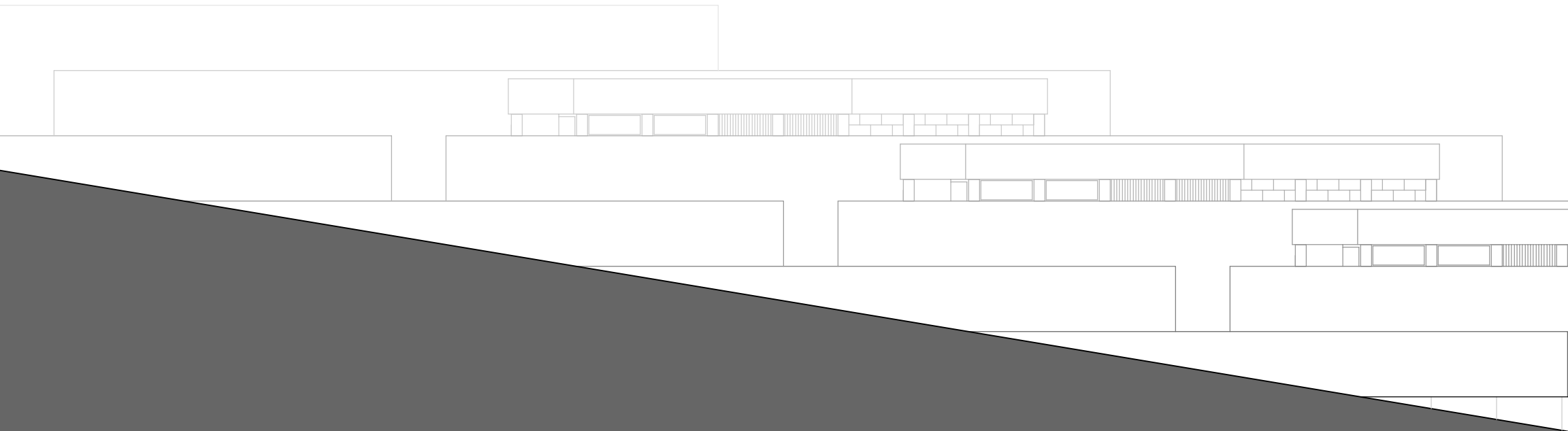
The main responsibility of the secondary wall is to define space. Joined to the uphill primary wall at the first groove (1), the secondary wall wraps around the bedroom and bath continuing from outside to inside. The secondary walls are six inches thick from interior to exterior surfaces and are based on standard wood frame construction. This wood wall is comprised of half inch thick cabinet grade interior plywood, a two by four stud wall with insulation, half inch thick OSB sheathing, one inch thick rigid insulation, and finally sided in half inch thick two inch wide vertical wood siding. The foyer closet is constructed in a similar manner.

The meditation chamber is standard eight by sixteen concrete masonry unit construction. This is the only room in the cell which does not rely on the primary walls for its beginning or end. The meditation chamber stands alone, a house within a house.

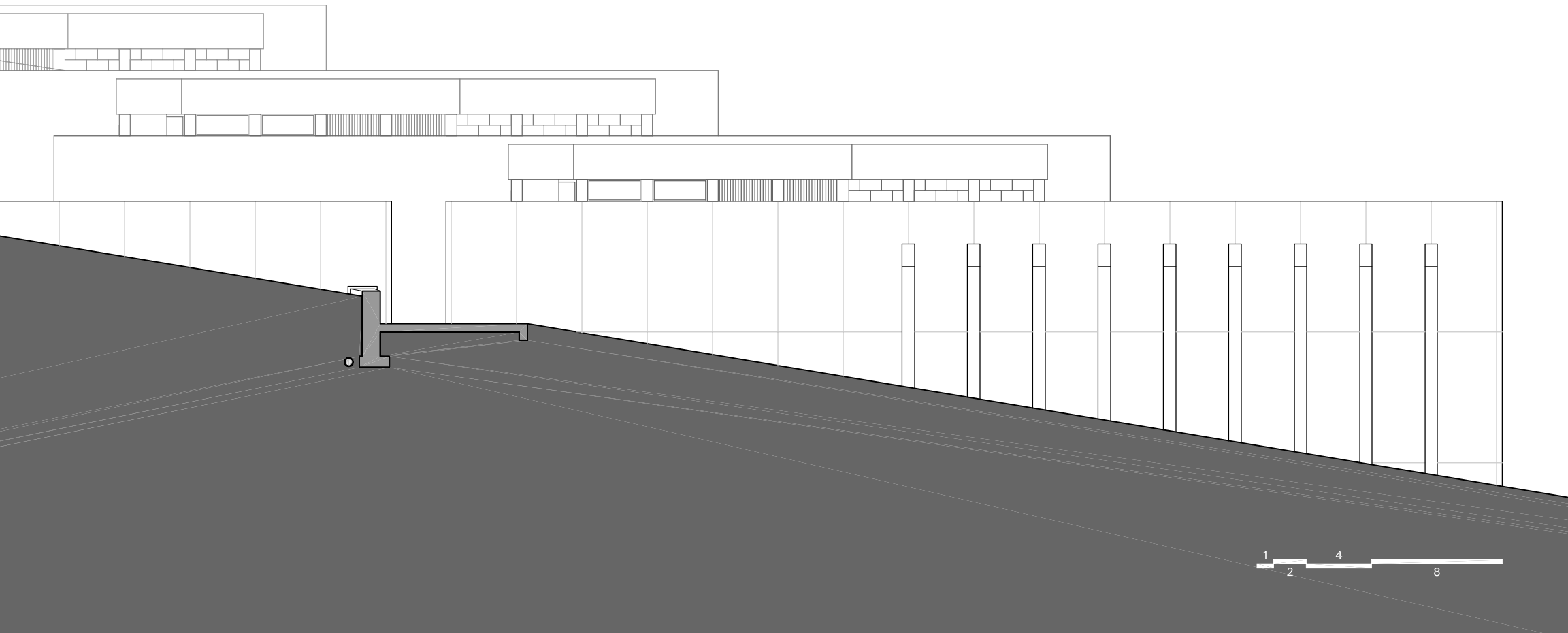
The spaces left between the primary walls, wood walls, and CMU walls are filled by glass windows with two by six inch mullions. The one inch thick insulated glass alternates its front and back mullion position based on the pattern of the total window assembly (2). At the back of the cell the window wall helps to reconcile the uphill primary wall with the beams above, the interior stairs, and the meditation chamber opposite. This is accomplished through mullion placement which aligns with the construction joints of the various materials used.

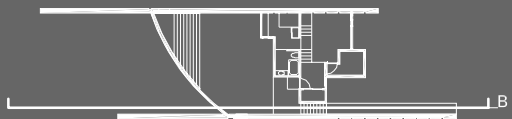
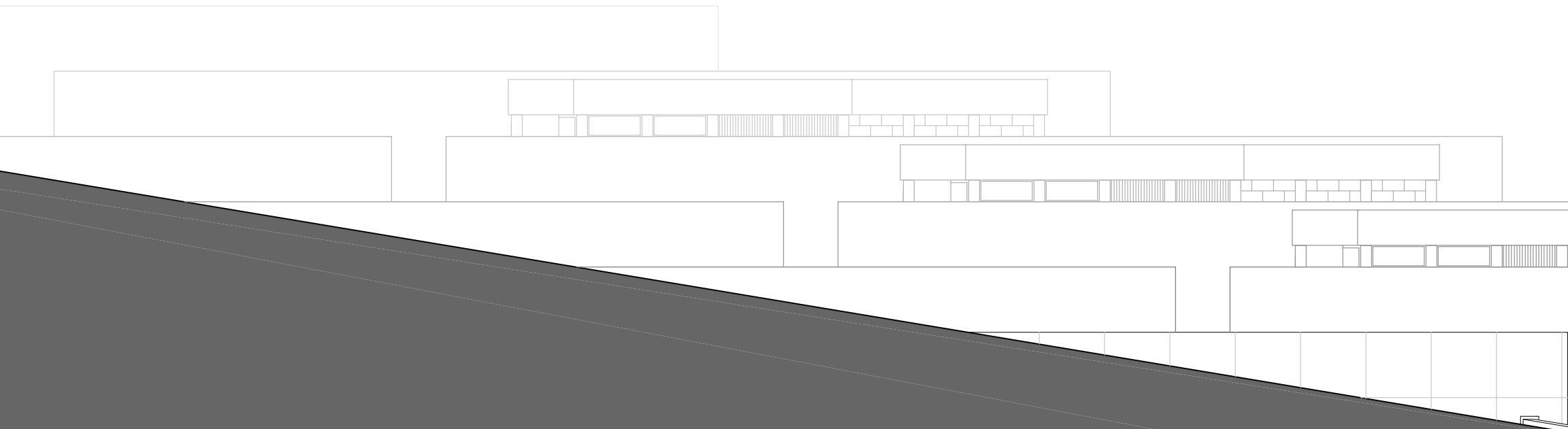
In a similar manner, the floor reconciles the elevation of the front of the cell with the elevation at the back of the cell. While the beams remain at a constant height, the floor compresses and expands based on the particular room's position on the hill and the room's use.



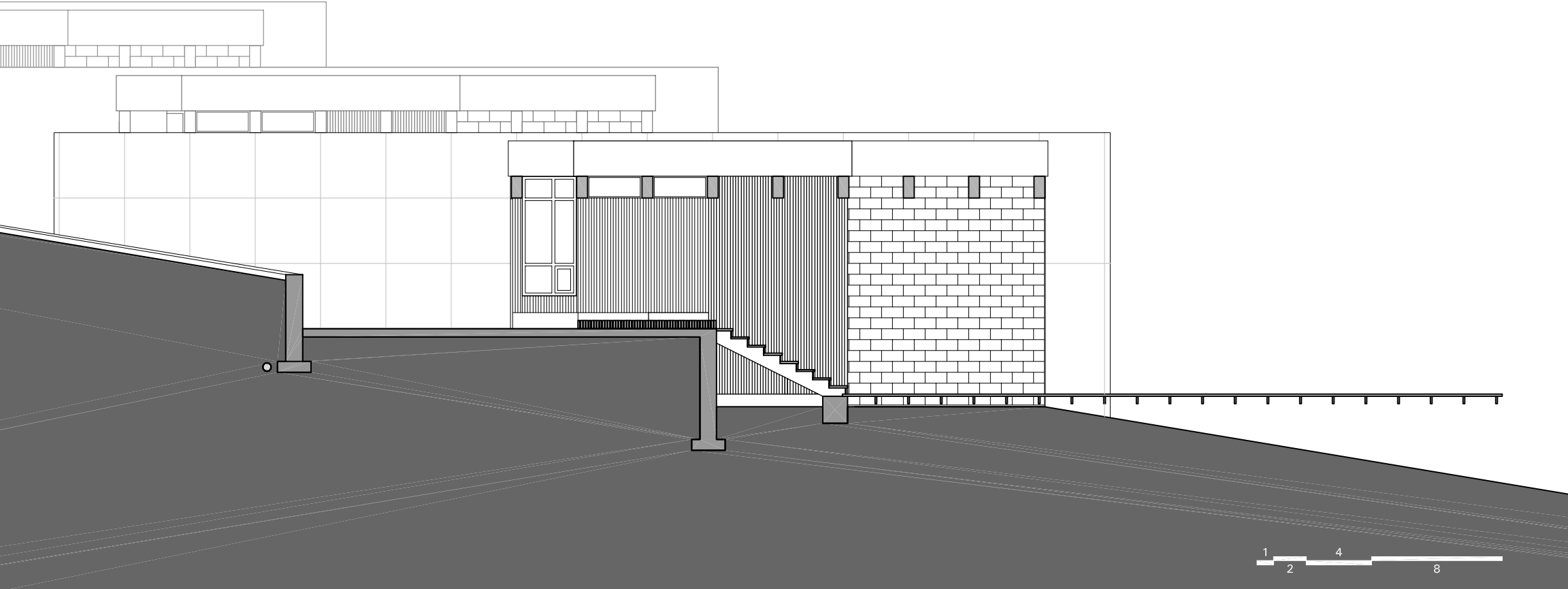


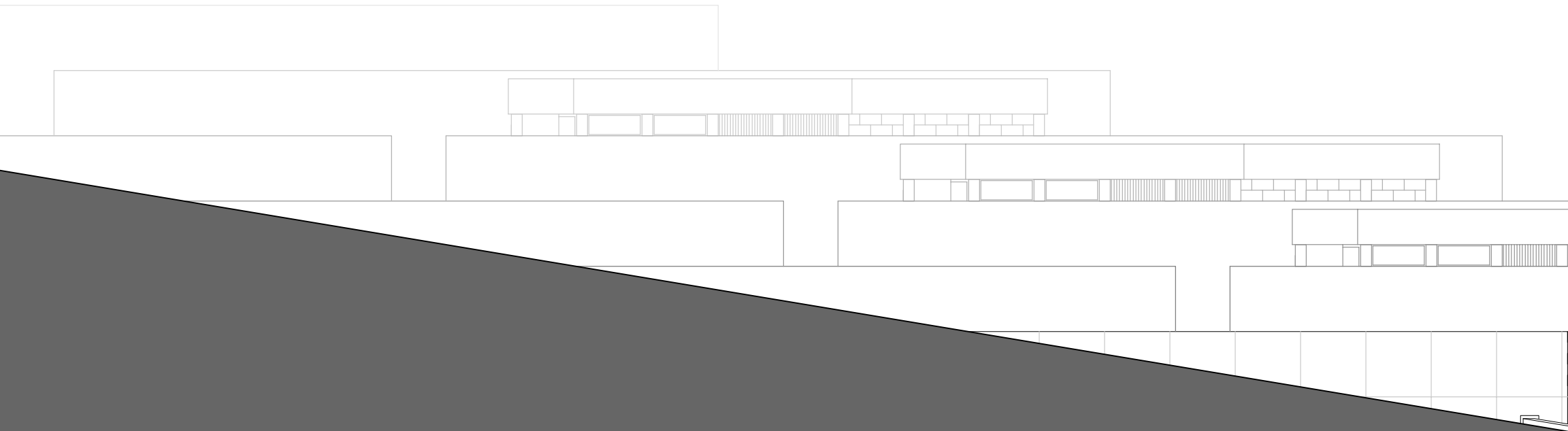
Longitudinal Section A





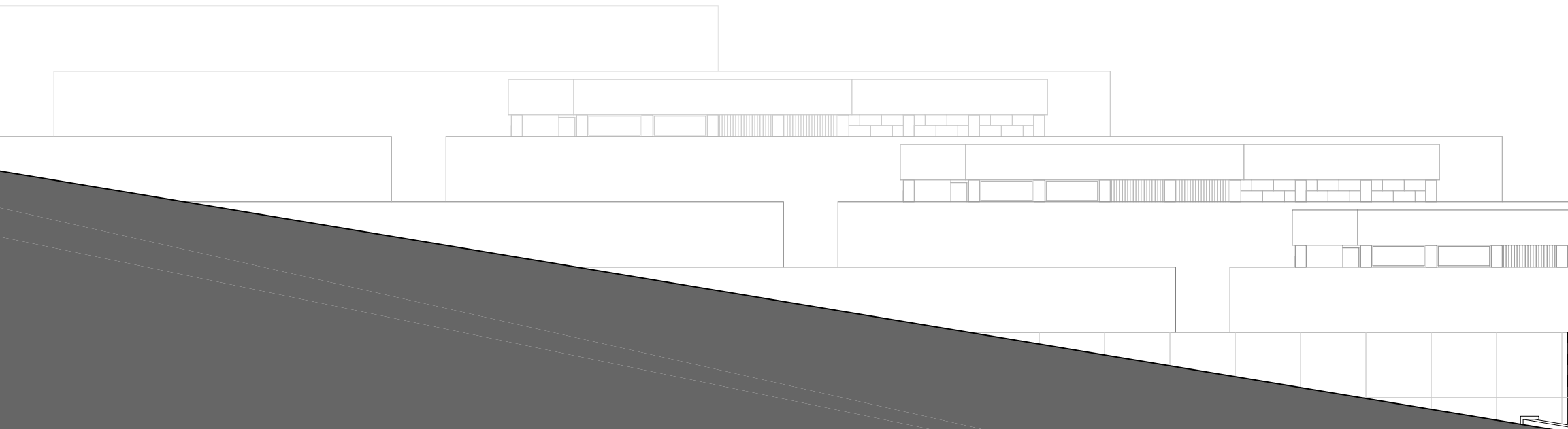
Longitudinal Section B



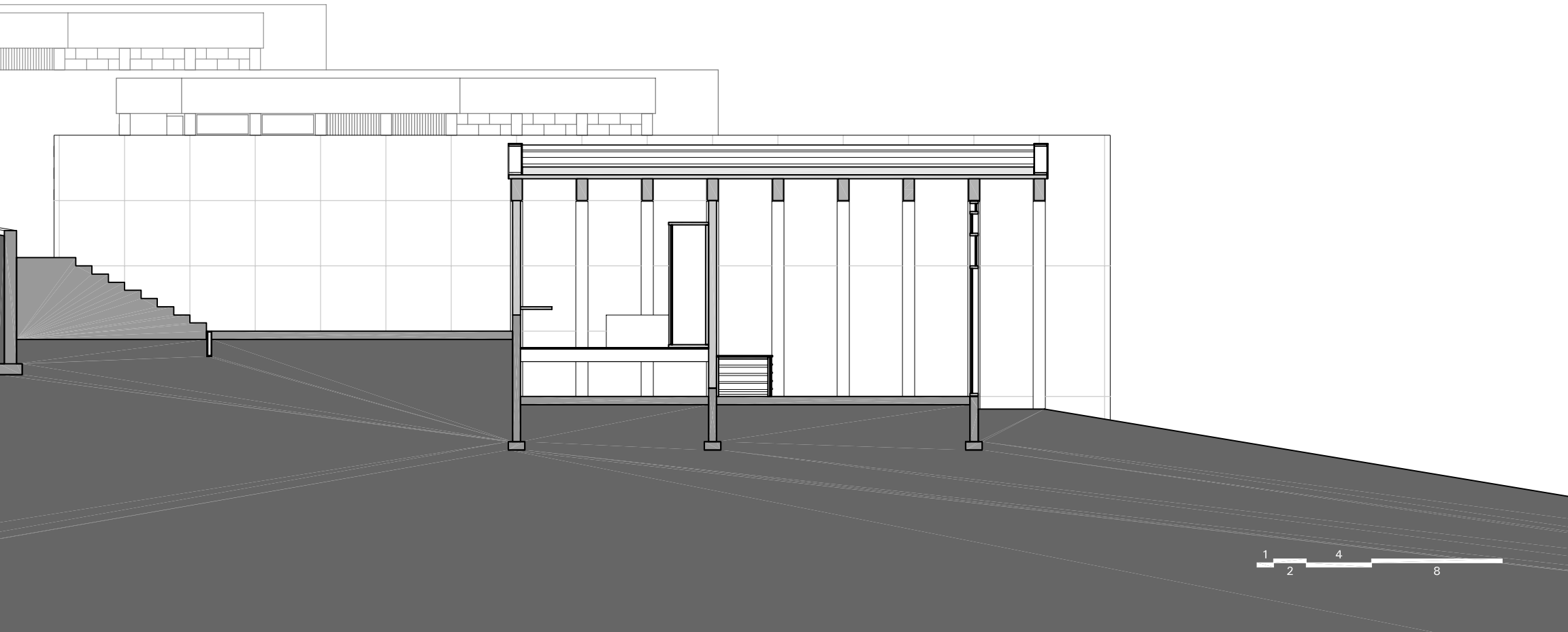


Longitudinal Section C

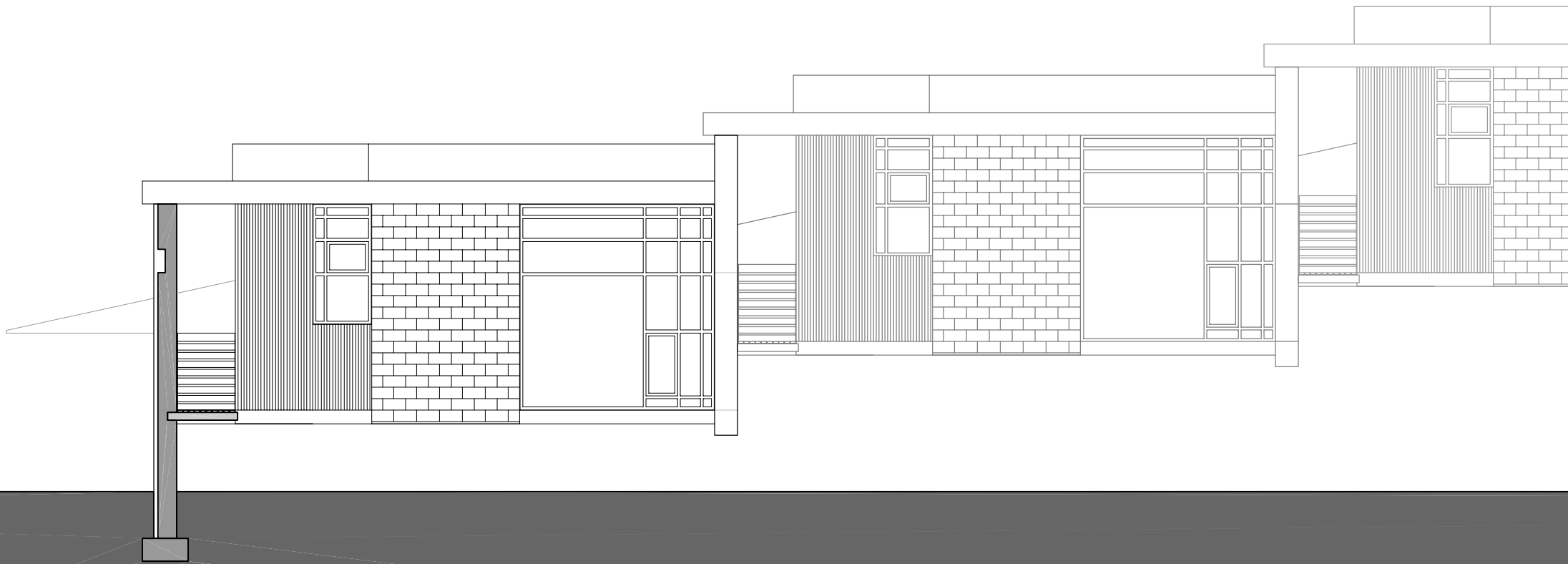


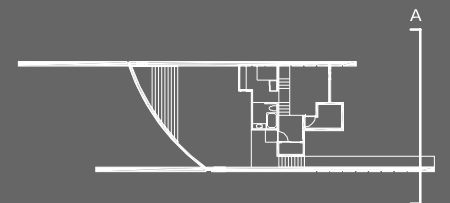
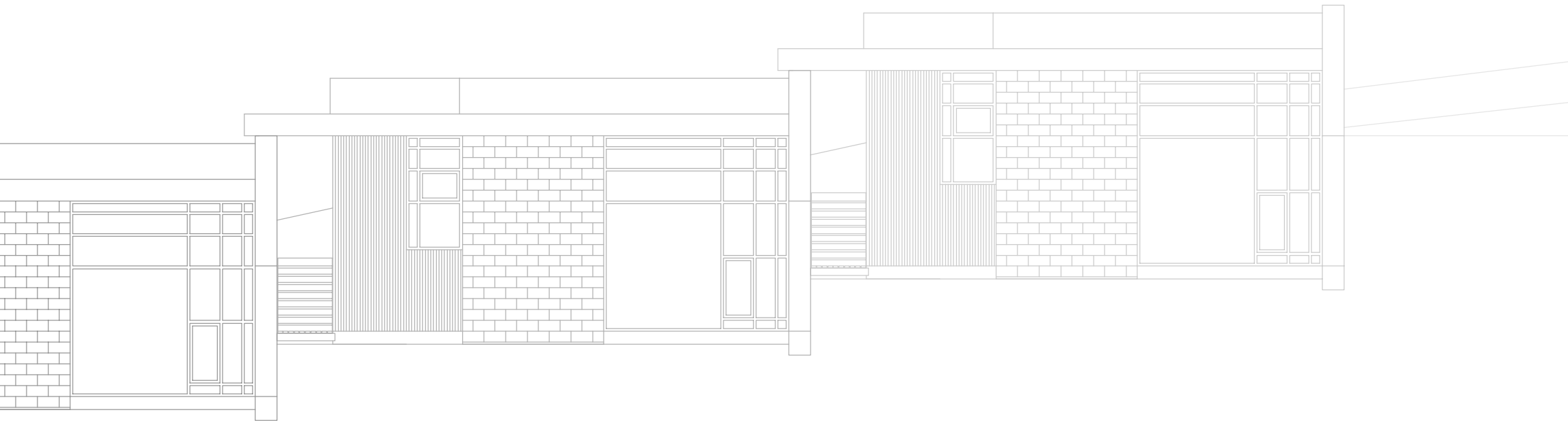


Longitudinal Section D

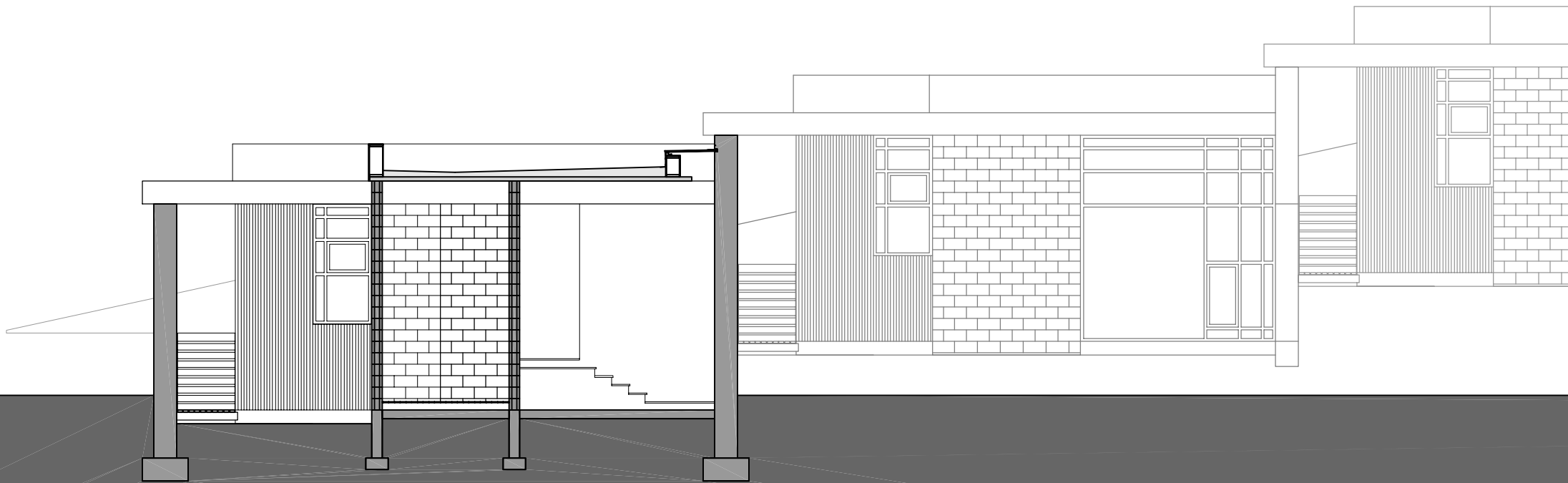


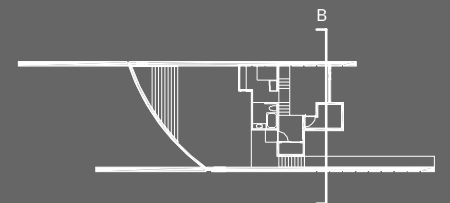
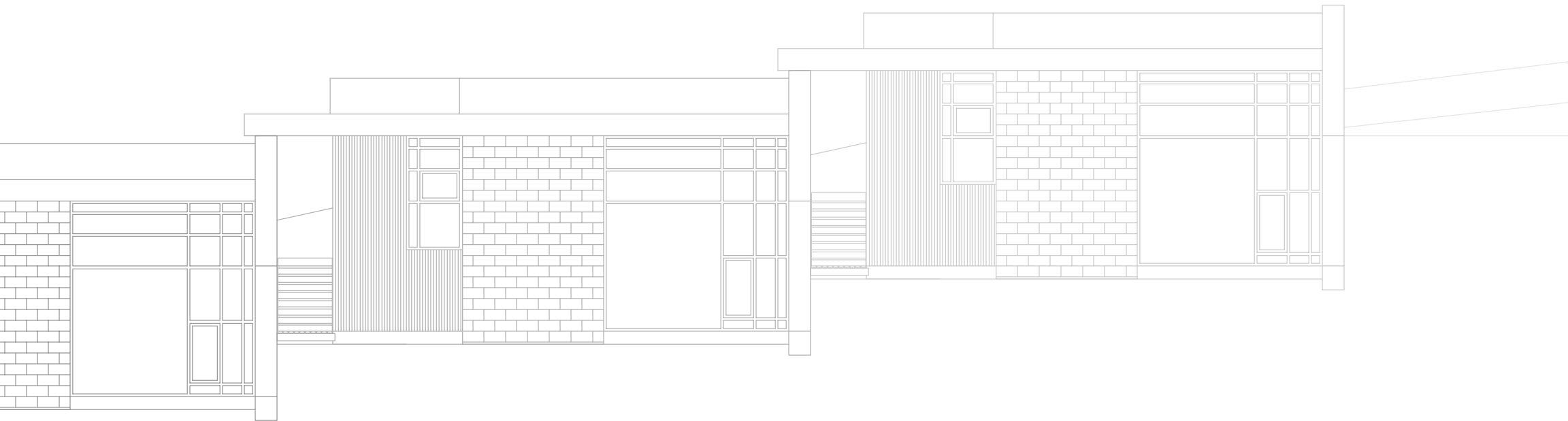
Transverse Section A



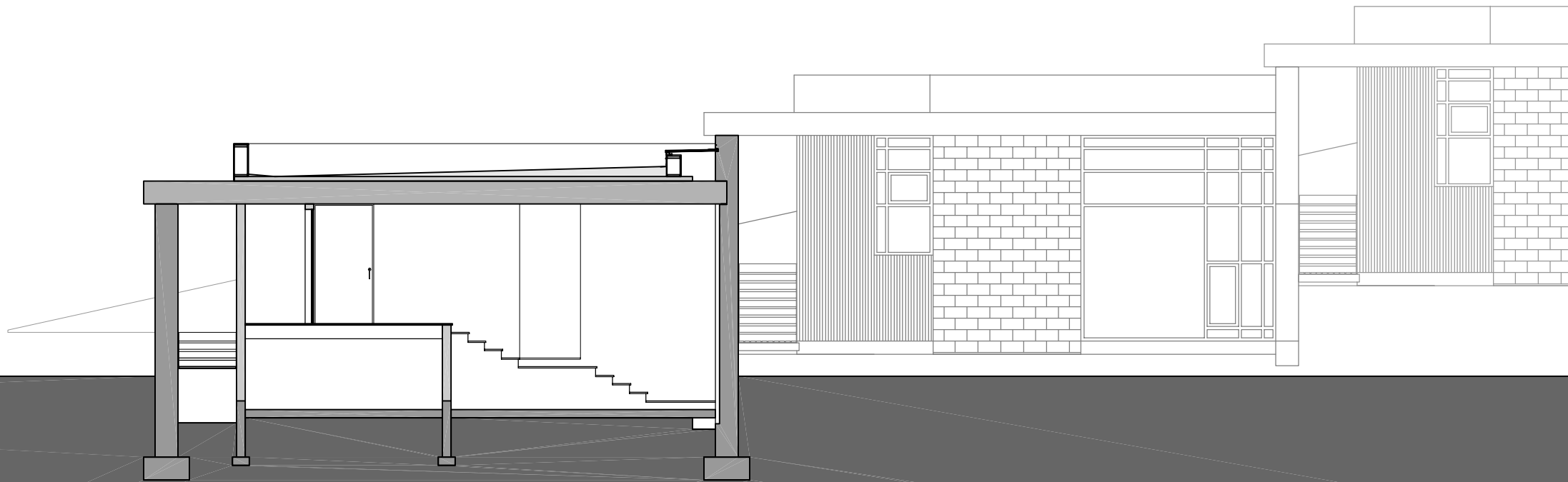


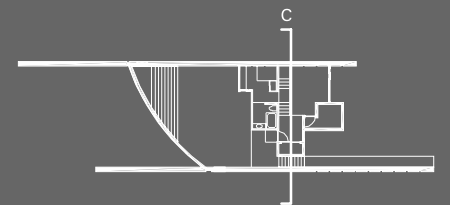
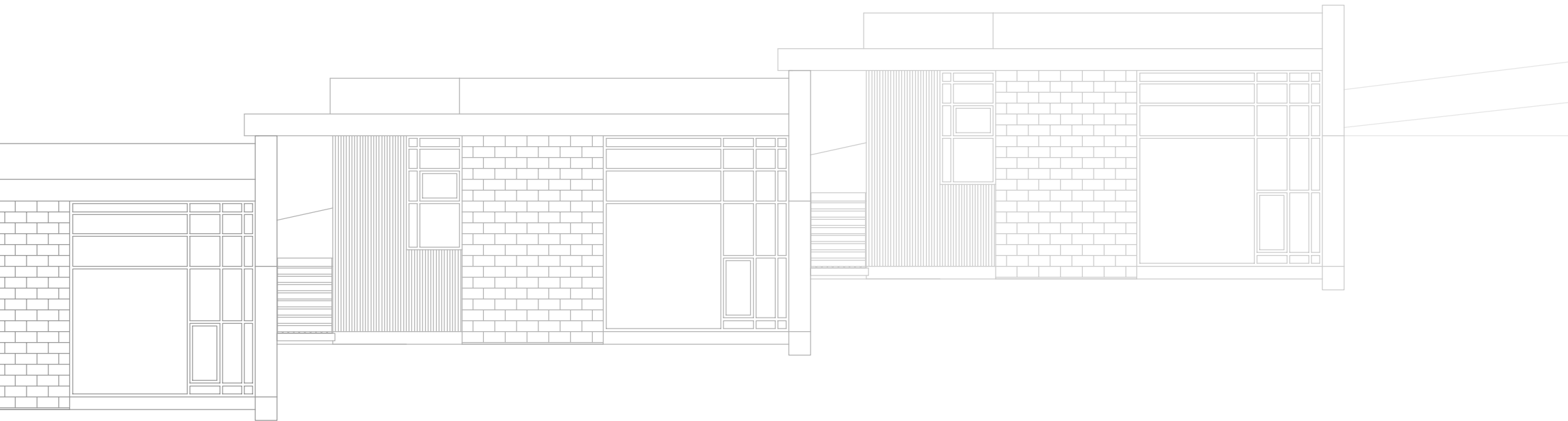
Transverse Section B





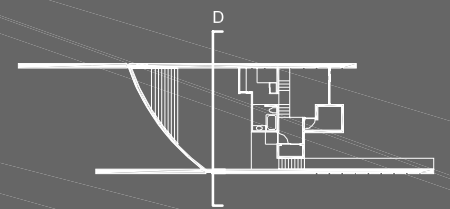
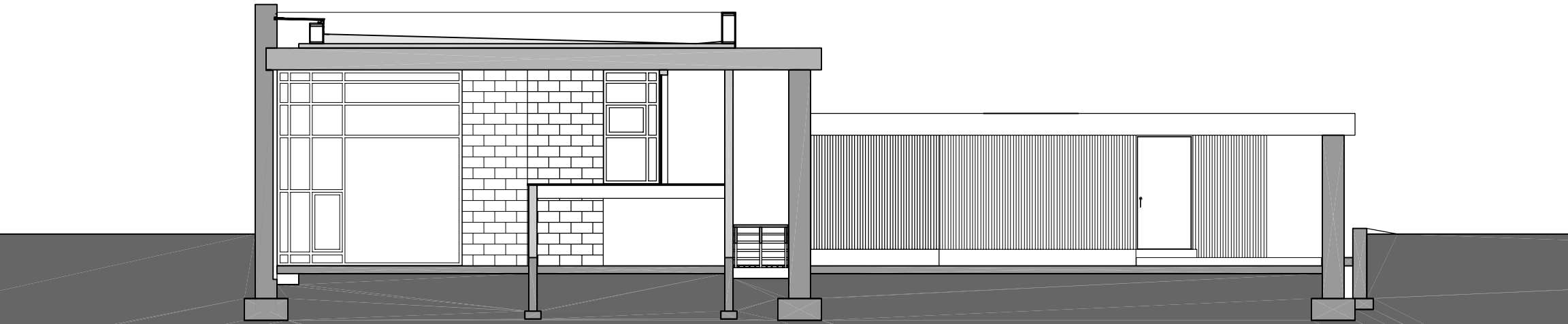
Transverse Section C





Transverse Section D







Orange
(BM 527)

20

612

Cem

560

506

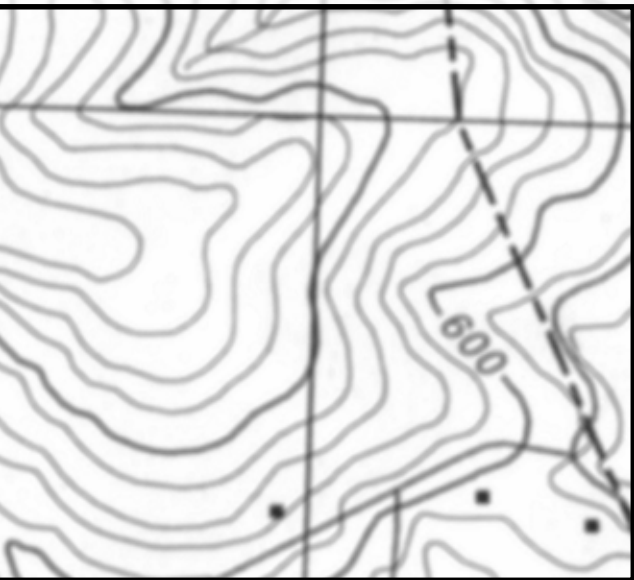
647

500

600

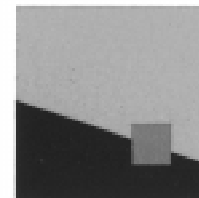
480

520



Site

The site occupies a hilly ridge which runs parallel to Route 15, just outside of the town of Orange, Virginia. Access to the site from Route 15 is provided by Mayhurst Lane. A mixture of pasture and thick woods, the site slopes down to the southeast where it borders a portion of Mayhurst Lane. From Mayhurst Lane, one approaches the site entrance by way of a sweeping drive which slowly reveals the Retreat Center as one proceeds up the hill.



Site Photography

View of the approach to the site via Mayhurst Lane.







View to the northeast from the upper site.

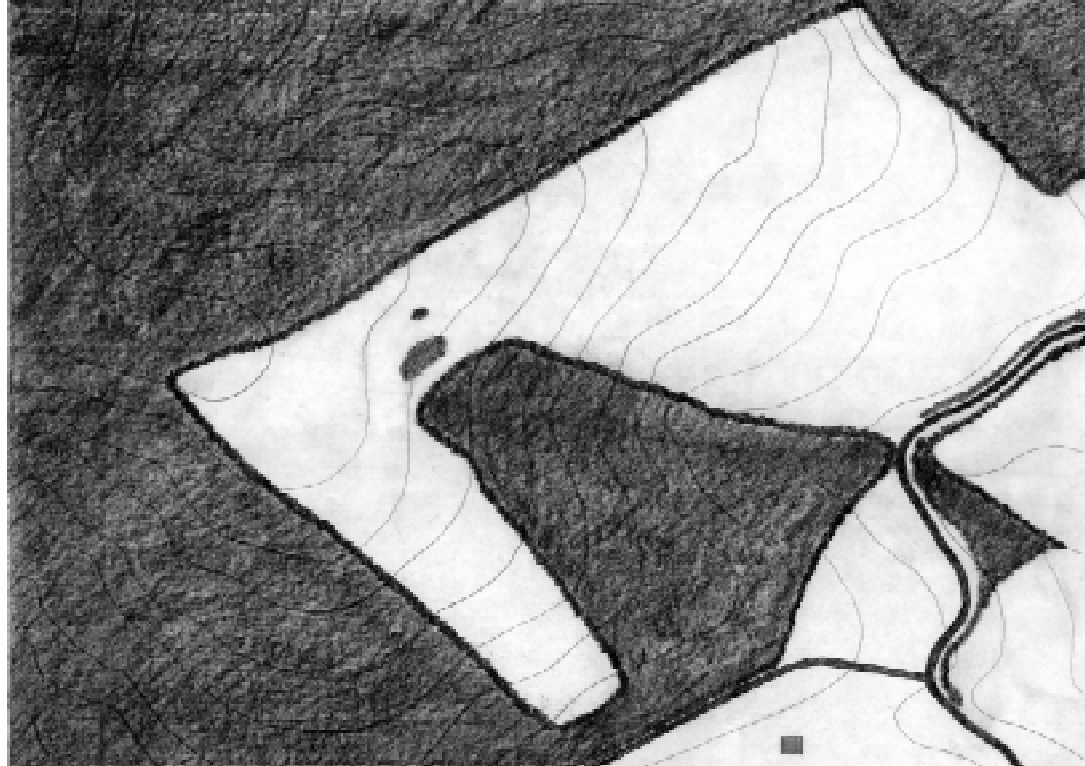


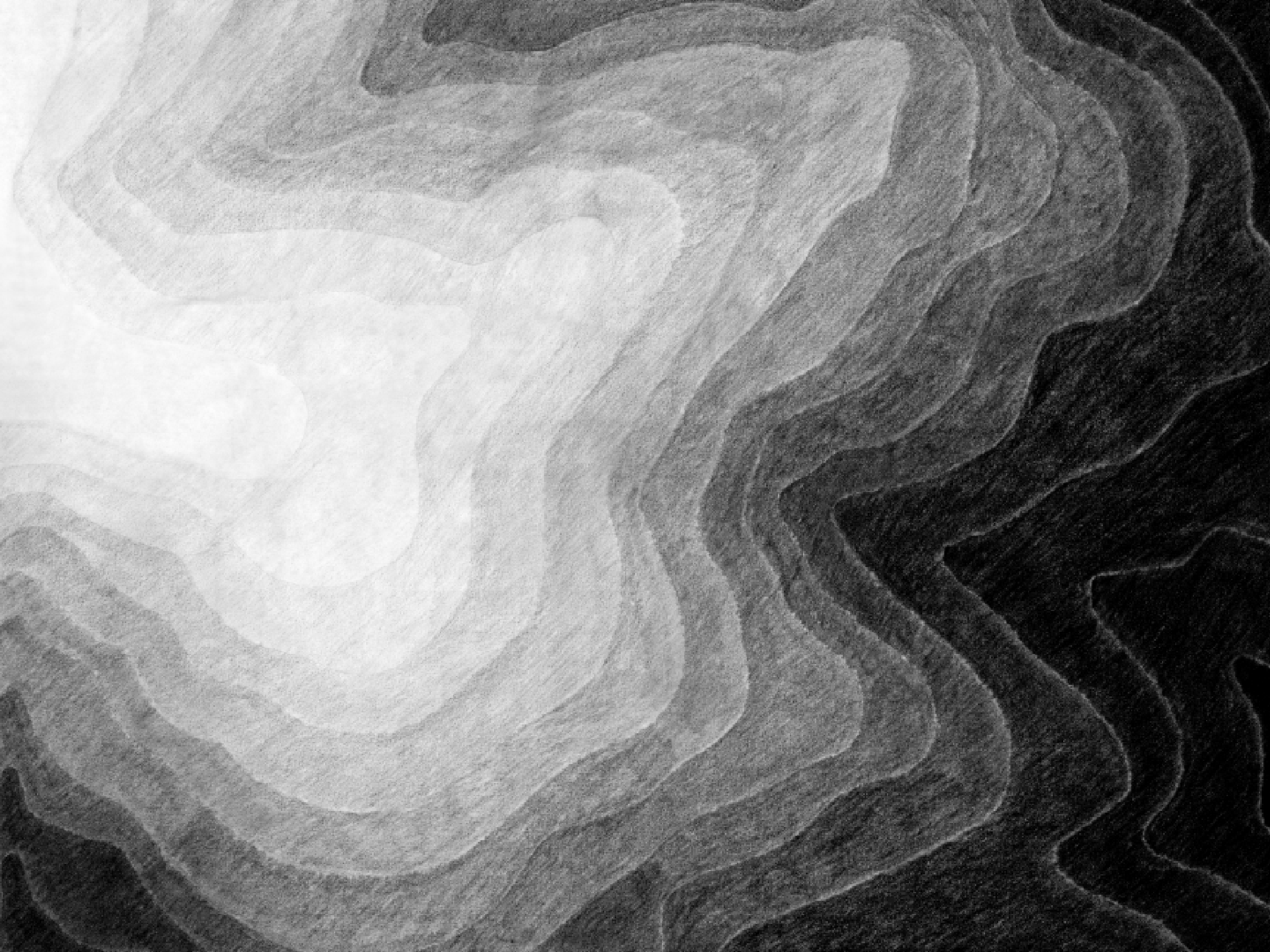
View to the southeast from the upper site.

Study of Existing Topography and Vegetation

Looking at the study opposite, one sees that the elevation gain from the lower site to the level upper site is approximately one hundred and eighty feet. The ground undulates in waves through the eastern pasture, while the narrow back pasture is a steady incline of approximately sixteen percent.

The woodland surrounding the open pasture (see inset) is made up primarily of local hardwoods such as oak, ash, and poplar with an occasional juniper near the pasture's edge. The pasture is currently used for winter grazing and hay production in the summer. In summer the woods become a dense edge to the pasture, while the winter reveals a forest of straight verticals receding into the background.







Precedent: Ordered Landscape

I remember walking through the Tuilleries on my first trip to Paris many years ago, and marvelling at the simple act of planting trees in a uniform grid. The imposition of a man-made order on a natural form was intriguing and made quite an impression on me.

I began to recall vivid memories of this trip when I began the site design. The desire for the site to become a counterpoint to the surrounding woodland and pasture inspired me to look at other examples of a man-made order using natural materials. Studying the work of Dan Kiley, Josef Plecnik, and Andre Le Nostre has been particularly educating.

Le Nostre's work is to be admired for his use of perspective, rational geometry and sheer scale. The ordering of natural materials on such a large scale delights us because it is so unexpected, so *unnatural*. One can enjoy a walk in the woods and admire the beauty of the different tree species, but it is an unexpected wonder to see these same natural elements within a man-made order such as that found at Versailles.

This is not to say that everything man-made is necessarily ordered. Most cities, for example, grow in fits and starts without a clear plan or order. Similarly, the Prague Castle was built over several centuries. Its conversion in the early twentieth century from a battlement to the seat of a new democracy was carried out by Josef Plecnik. If one looks at Plecnik's development of the Paradise Garden at Prague Castle we see throughout the design process a desire to reconcile an ideal axial order with an asymmetrical reality. His final design reconciles the ideal with the reality to bring order and harmony where none existed.

Dan Kiley, a contemporary architect, takes the geometry of Le Nostre and pares it down to a simplified beauty. Kiley designs places which cannot be mistaken for anything *but* a man-made order. He creates true places by transforming natural forms into a rational order. This contrast of order and natural material enhances each element of the design. As Garret Eckibo, Dan Kiley, and James Rose put it in their 1939 manifesto, "... Harmony is the result of contrast: opposites that complement one another."

It is this complimentary order which I sought in developing both the built forms and the site, each informing the other as the project progressed.



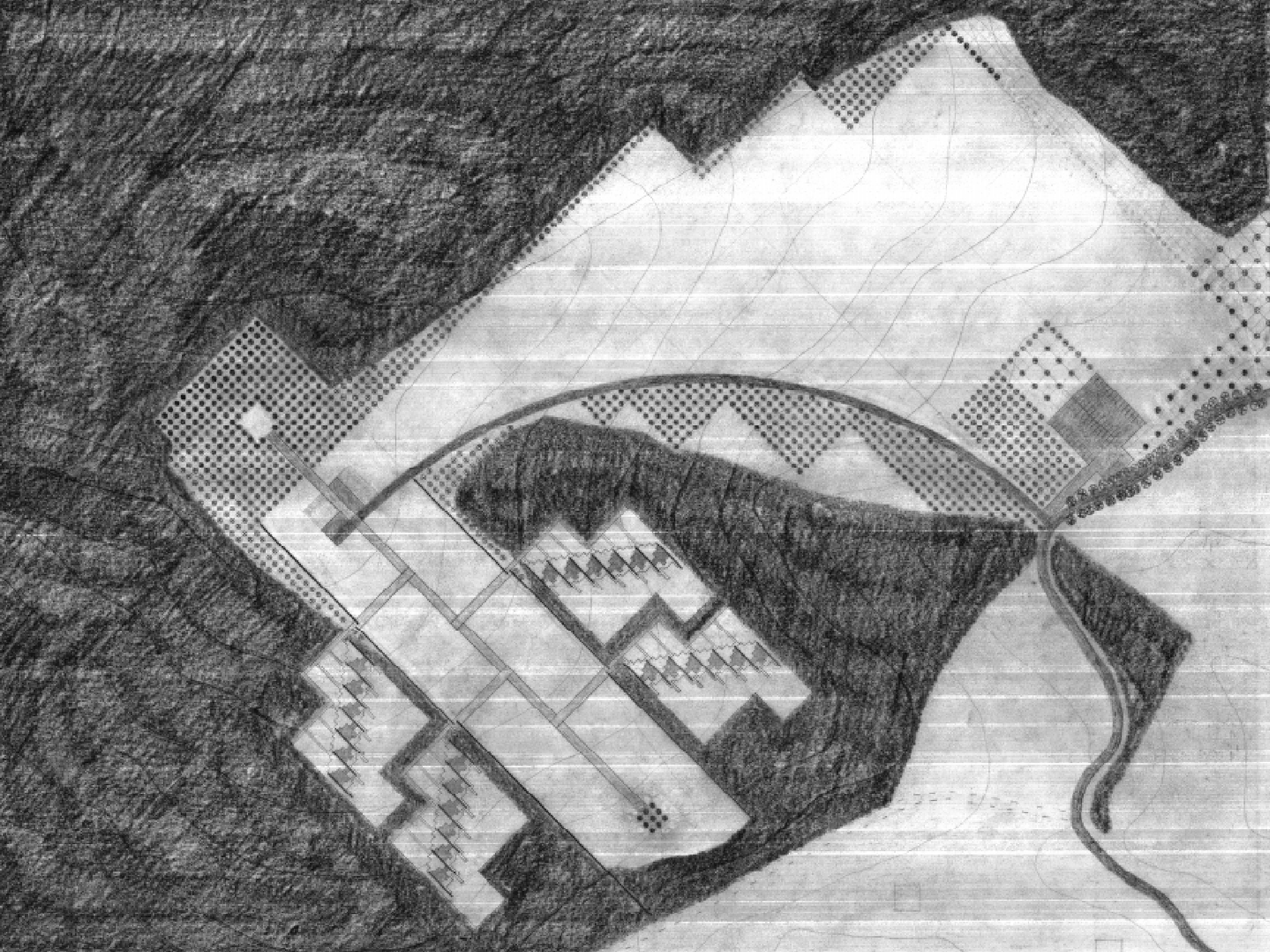
Opposite Photos, Clockwise from Top Left: Paradise Garden at Prague Castle by Josef Plecnik. Miller House Garden by Dan Kiley. Allée Royale, Versailles by Andre Le Nostre. The Henry Moore Sculpture Garden by Dan Kiley. Inset Photo: Miroir d'Eau, Chateau Sceaux by Andre Le Nostre. Background Plan: Versailles by Andre Le Nostre.

Site Plan One Development

This first plan sought to bring man-made order to the entire site. An orchard planted in a grid contrasts with the disorder of the surrounding woodland. Additionally, an attempt was made to link the upper and lower sites while directing the approach to the site via a curving drive.

The drawing clearly shows that at this time there was no link between the *idea* of the site plan and the *reality* of the site. The plan is imposed on the hilly site with no relation between the two. For example, the edge of the forest is shown as a precise line, something unattainable with the existing trees.





Site Plan Three Development

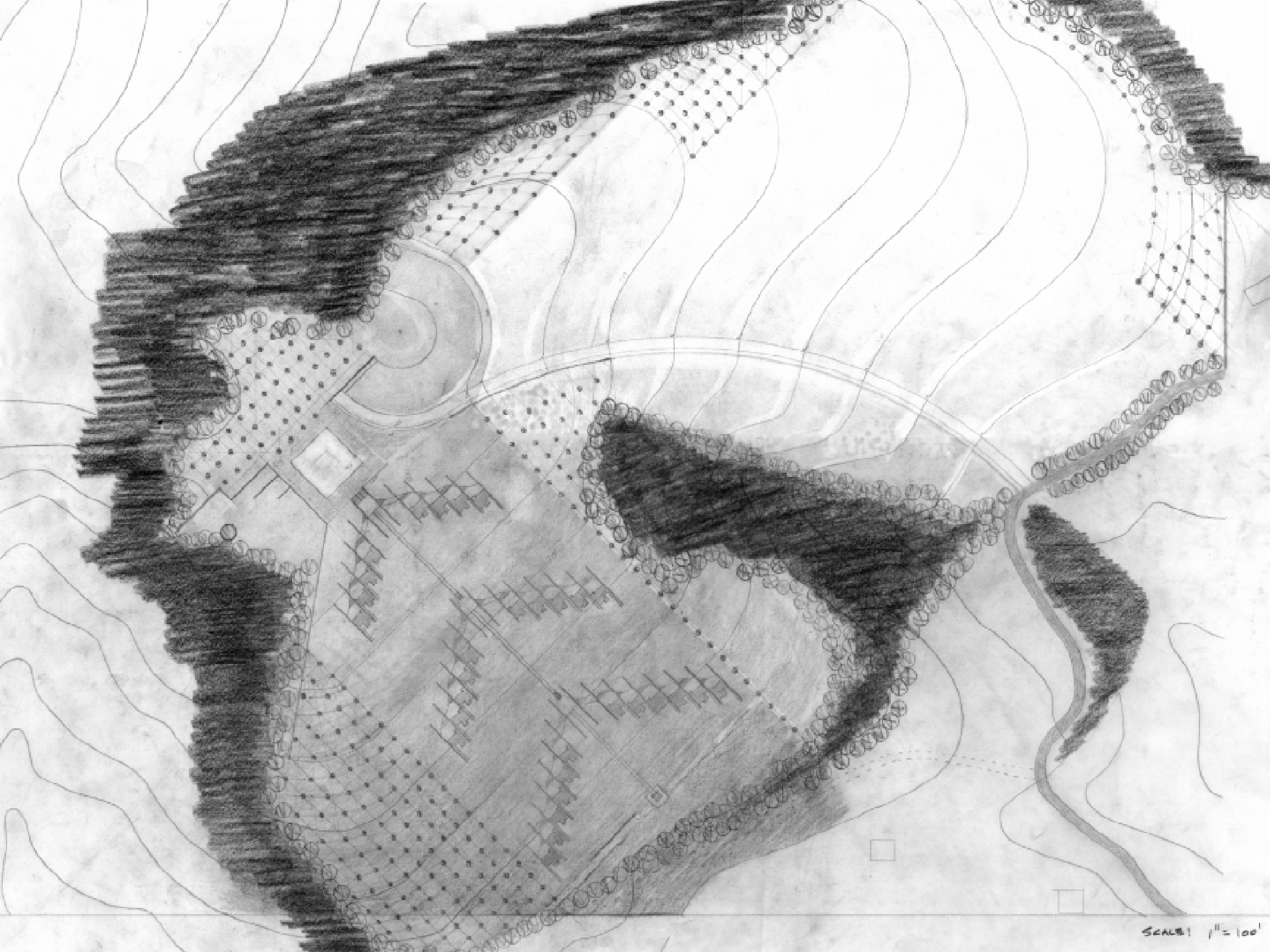
In this site plan we see two ideas which would mature with the development of the project. The first is the use of a sweeping drive to link Mayhurst Lane with the upper site. The second is the establishment of a central axis from which the cells branch off. Also, a gridded orchard has been carried over from the previous plans.

The upper site is still undeveloped beyond the diagrammatic stage and the site plan as a whole is still immature in its relation to the reality of the terrain.

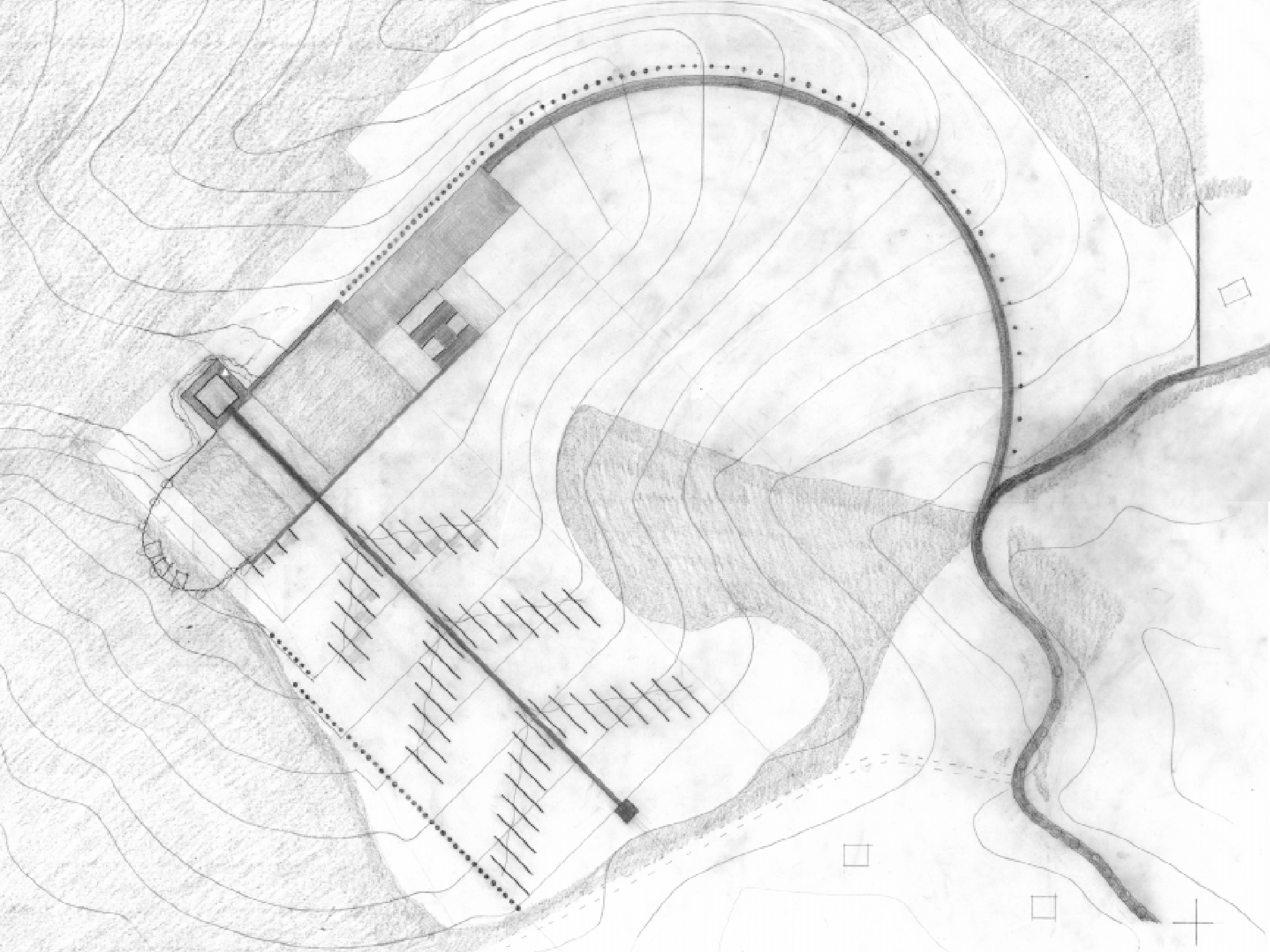
Site Plan Seven Development

This site plan represents the maturing of the design process with regard to *idea* of site and *reality* of site. The land has been transformed to a consistent slope to accommodate the cells, and the undulations of the slope to the east have been softened and incorporated into the sweeping curve of the approach drive. The woodland cut in order to make the contour changes has been allowed to remain basically unchanged, in contrast with the order of the rest of the site.

In addition, the development of the sinuous retaining wall with cells mirrored about a central axis is complete. The lower terminus of the central axis has been determined, but the upper site is still not fully developed.



SCALE: 1" = 100'



Site Plan Ten Development

Here, the site plan is nearing completion. The central axis ends with a small flat platform at the lower end of the site, and terminates at the upper end with the chapel. Auxiliary buildings begin to form a secondary axis along the top edge of the hill. The sweeping drive is now more fully integrated with Mayhurst Lane as well. The woodland along the north-west quarter of the site has been cut to form a more structured edge.

Final Site Plan

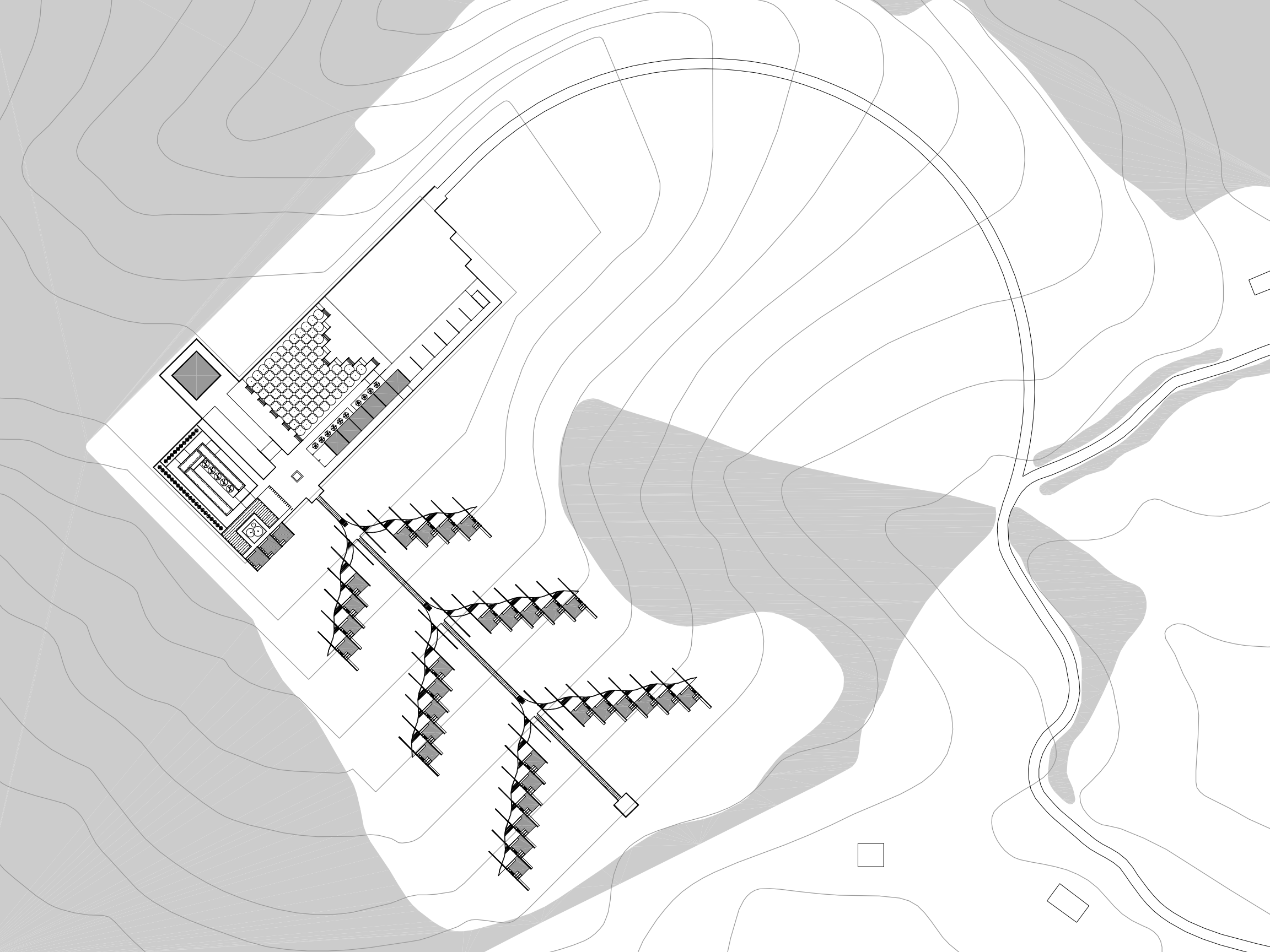
The development of the entire site has reached completion. A sweeping circular drive slowly reveals the site's pasture, woodland and finally the entrance to the upper site.

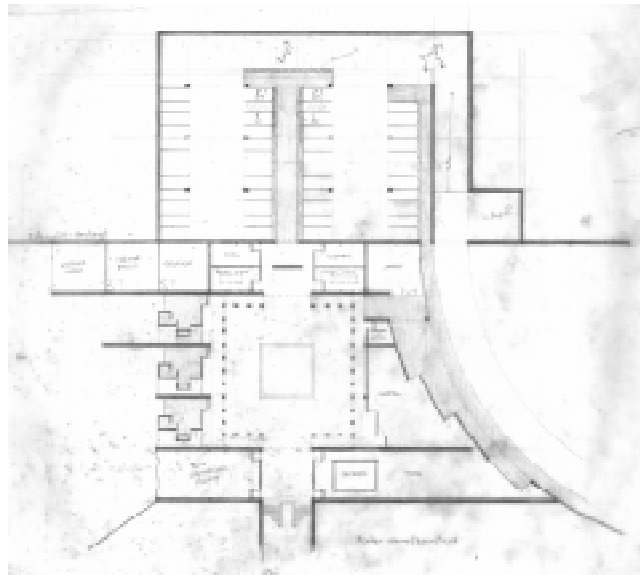
The major axis of the site terminates in a level platform on the lower end of the hill, while the chapel provides the upper terminus. The three flights of cells cascade down the grassy slope, bisected by this major axis.

The secondary axis crosses the major axis at a square plaza located on the multilevel upper site. This secondary axis orders the placement of the community building and handicapped accessible cells and garden. North of the secondary axis are the orchard and parking area to the east, with a lower level ramp garden to the west.

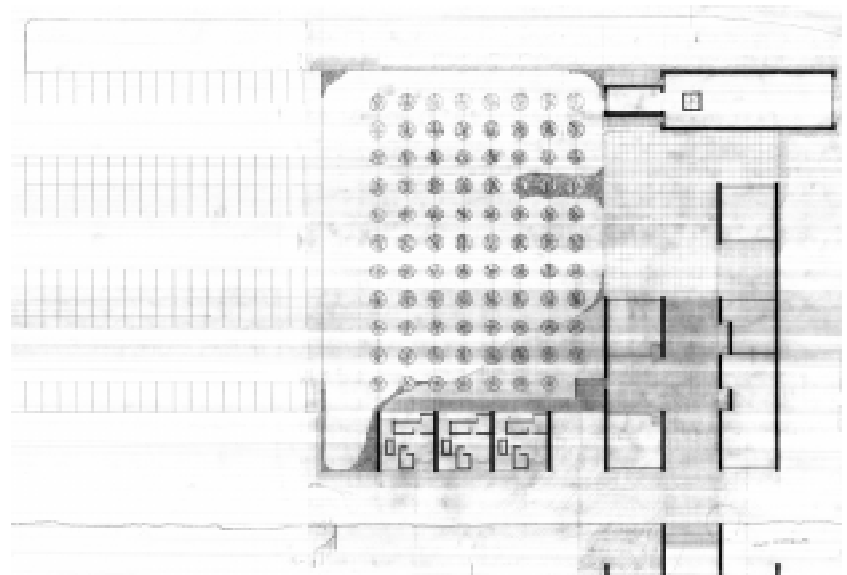
At the plaza, the path to the chapel widens and the elevation increases via a ramp. A courtyard surrounds the chapel which helps to define this place as the beginning and ending for the entire site.







1



2

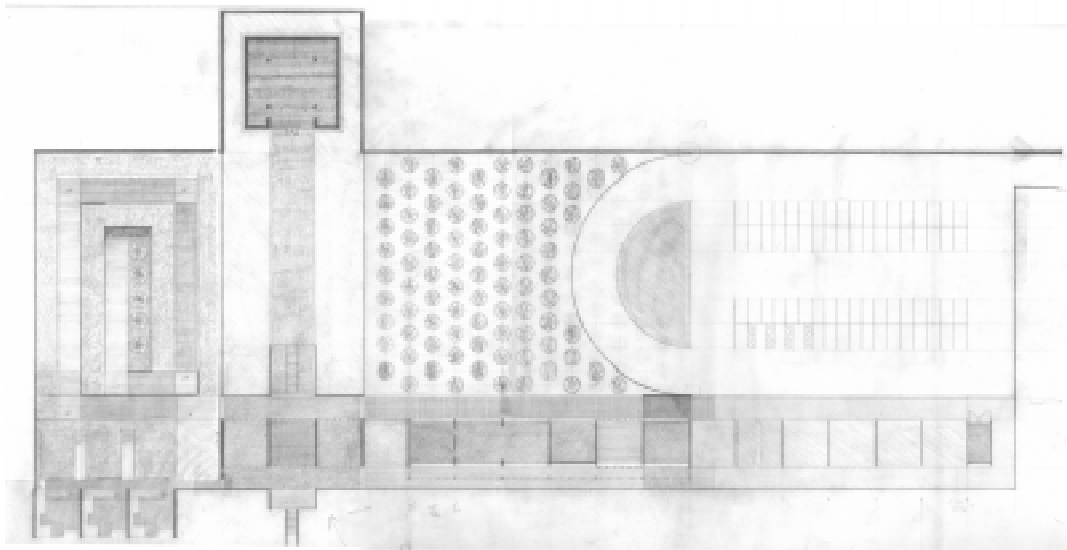
Upper Site Development

The upper site was developed in conjunction with the entire site plan. However, it was not until the upper site was clearly defined as the terminus to the major axis that it started to develop beyond diagrams.

One of the first detailed versions (1) shows a cloister with the chapel, dining hall and handicapped accessible cells surrounding the central cloister. This proved incompatible with the idea of an axis running through the site.

Further development (2) brought about the chapel as terminus but turned ninety degrees to the central axis. Secondary buildings were placed on either side of the axis, with a courtyard between the chapel and other buildings. The orchard was introduced again to act as a filter between the parking area and the courtyard.

In the final development stages (3) the major axis is clearly terminated by the chapel. A secondary axis is introduced to accommodate the other buildings. A single community building now houses both dining facilities as well as office and classroom space. Solitary walls continue the rhythm of the community building to the east. The handicapped accessible cells are placed along the secondary axis on the other side of the major axis. In addition, the natural materials used on the site are beginning to be thought of as real tangible objects rather than as theoretical design elements.

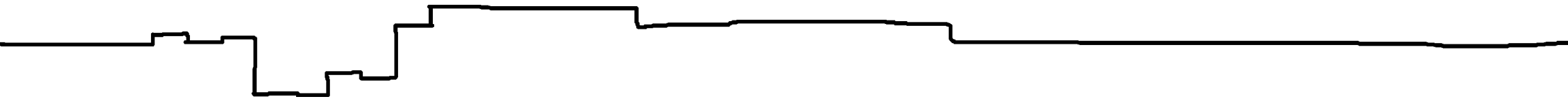


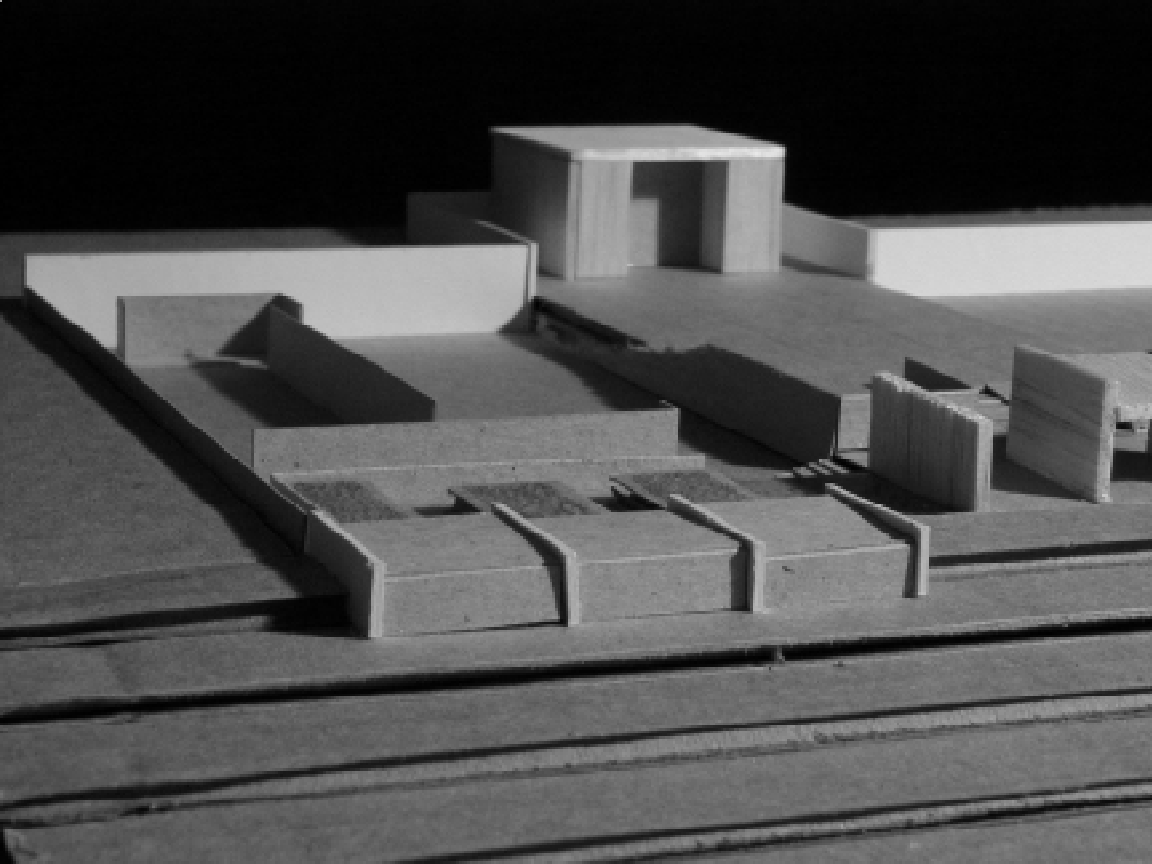
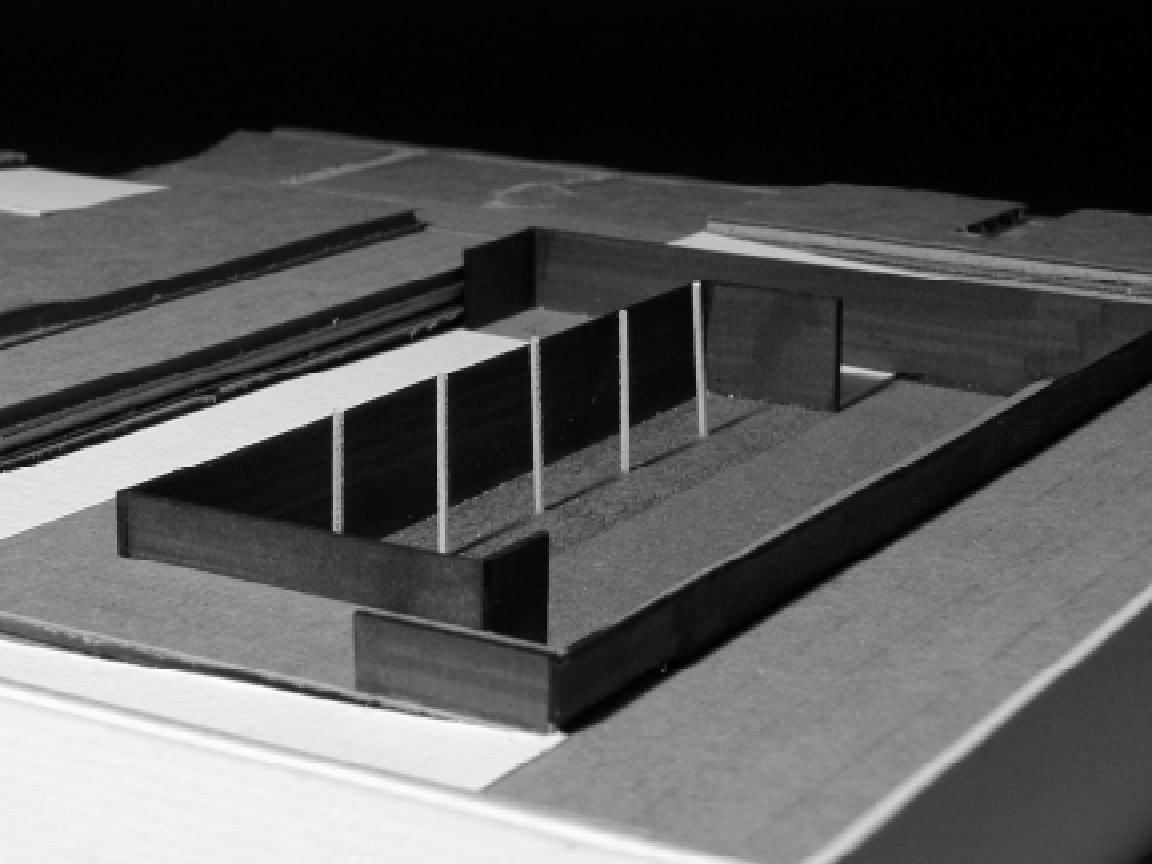
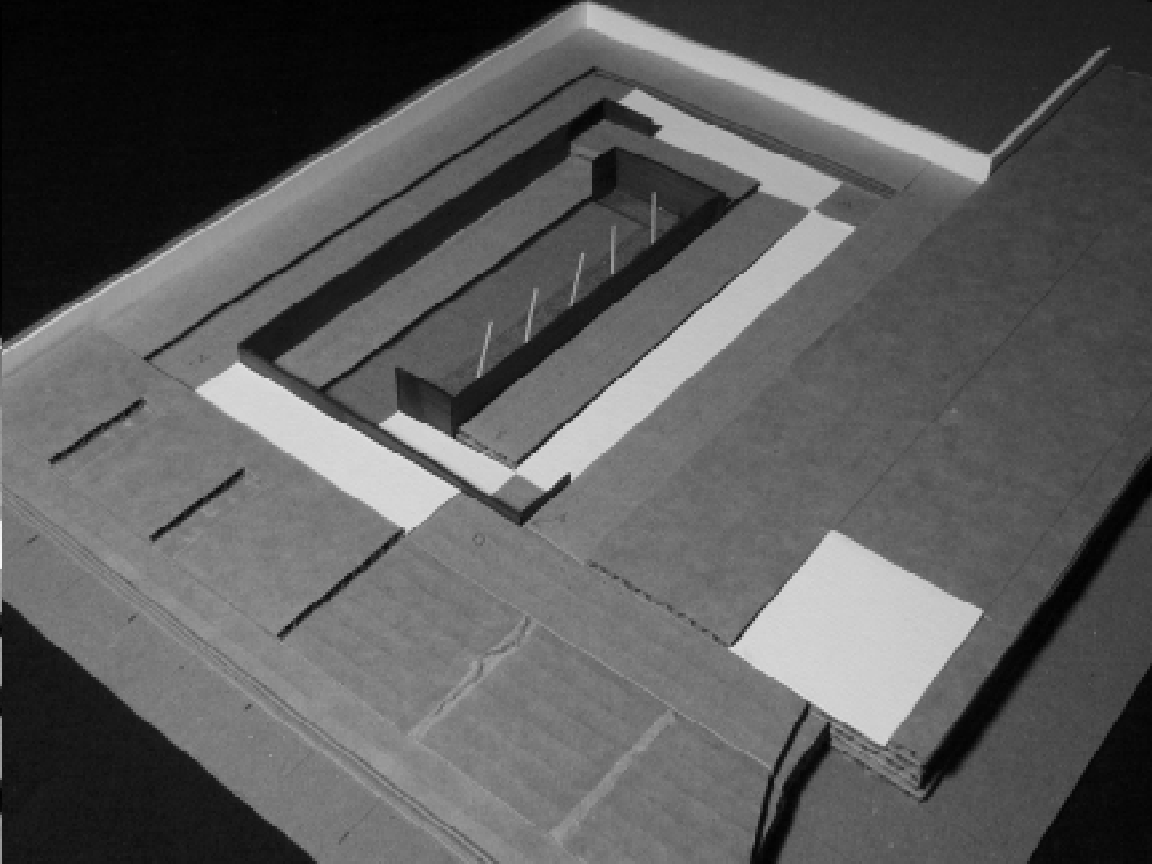
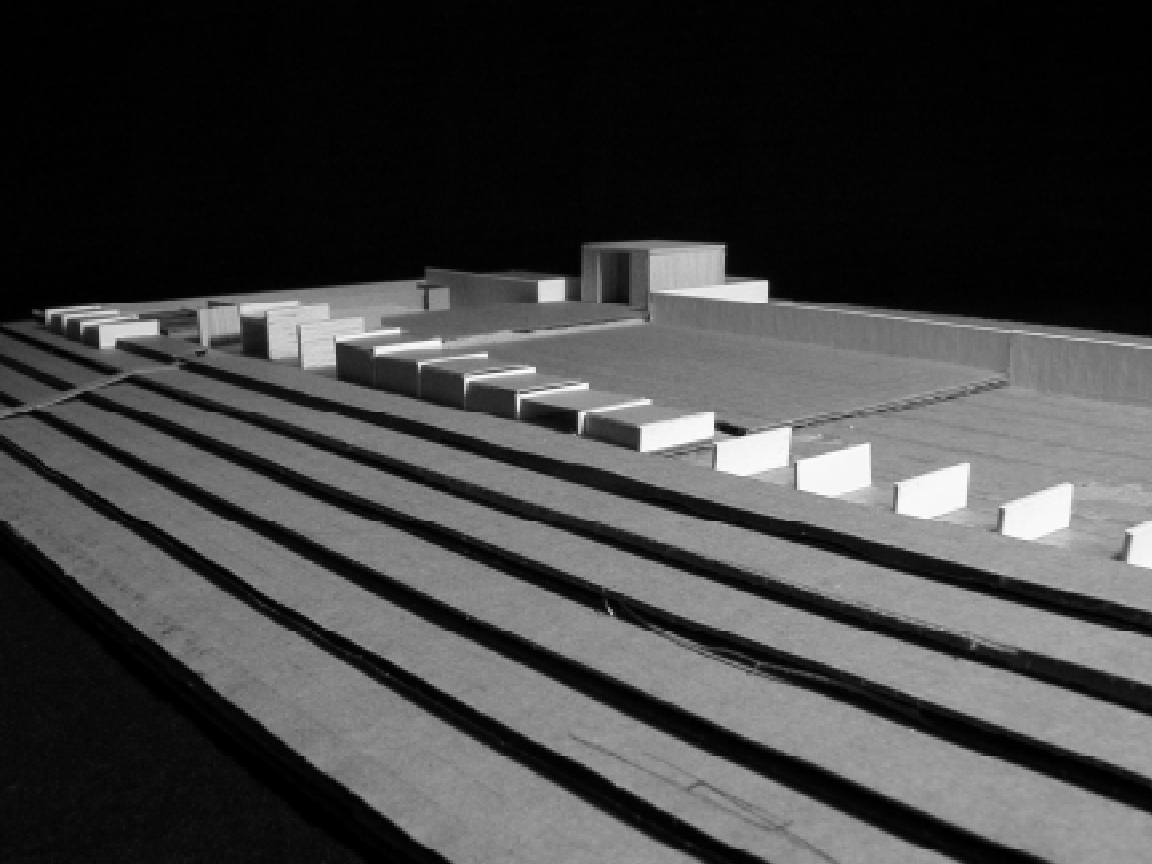
Working Models of Upper Site

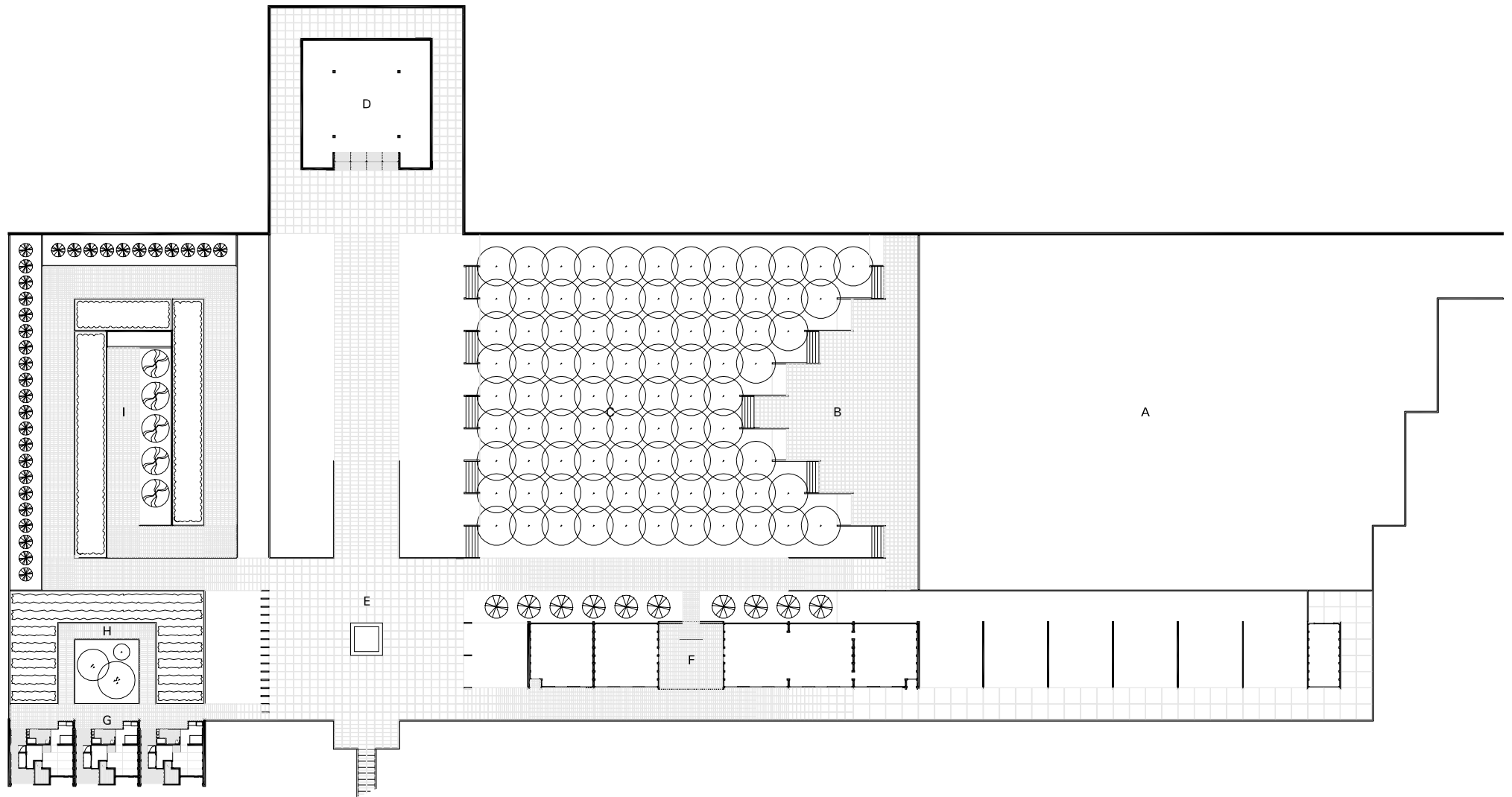
In the development of the cells the slope provided significant resistance, helping to inform and transform the cells.

The upper site, however, had minimal slope. Part of the maturation of my thinking was learning to create a place through geometry and transformation of existing conditions. The upper site began to become a *place* when order was established through the use of a secondary axis to order the various elements.

Moreover, the different areas within the upper site were further defined by a simple two foot change in elevation. Working models of the upper site and ramp garden helped me to understand the spatial qualities of these different elevation levels.







One enters the upper site via the sweeping drive originating at Mayhurst Lane. The drive proceeds through a cut away portion at the top of the hill. To your right, a thick wall starting at the entrance to the parking area (A) defines the northern edge of the upper site, only changing direction to defer to the chapel. The eastern edge of the parking area is defined by a staggering retaining wall. The parking area's floor surface consists of light colored concrete pavers which allow grass to grow between them.

To the west of the parking area is a small plaza (B) which allows for the arrival and departure of guests and visitors. The small plaza is paved in a light grey granite tile, which covers all the hard exterior surfaces of the upper site. Across this plaza a series of short stairways are staggered toward the center of the plaza.

These steps lead up to the cherry orchard (C) which is two feet higher than the small plaza. The orchard acts as a screen between the parking area and the rest of the site. One meanders through the orchard, the peastone floor crunching under your feet while the spring-time blossoms spread a canopy over your head. At the end of the orchard, another series of steps leads up a small grassy incline which is two feet higher yet again.

You now find yourself on a wide path paved again in light grey granite tile. The path is approximately thirty-two feet wide and stretches from the chapel to your right to a larger rectangular plaza to your left. Grass grows on either side of this chapel street with a four foot high wall along the western edge. This wall turns in on itself in a u-shape as it

approaches the central plaza. A similar wall is reflected on the side opposite but ends at the stairs on the eastern side of the chapel street.

Looking back at the chapel (D) you see that is square, approximately sixty-four by sixty-four feet in plan and half again as high. The side facing the main axis is sheathed in wood, with glass clerestory windows above. The remaining three walls are of concrete masonry construction.

Moving south you go down a ramp to the central plaza (E). A fountain provides a place to sit as the cool waters splash. Looking back to the east you see a path that leads back to the parking area. While the orchard is the ceremonial entrance to the site, this path sees everyday use by visitors. Opposite the orchard side of the path, birch trees are planted next to a long narrow building, approximately sixteen feet high.

This is the community building (F) which houses a classroom, the office, a covered courtyard, the dining hall and finally the kitchen. Constructed in a similar manner as the cell, concrete walls form the primary building structure, supporting beams and roof. In the buildings on the upper site however, the concrete walls form *projections* which allow a place for the roof beams to sit. Wood walls to the north and glass windows to the south infill between the primary concrete walls.

On the south side of the community building another path provides access for the guests. This path turns into a service route at the kitchen. Beyond the community building, eight foot high walls continue the rhythm of

the building onto to a grass lawn, terminating in the maintenance shed.

The view from the plaza displays the surrounding countryside to the south. Looking straight down the hill you see three flights of cells cascading down, originating from a central stairway. The stairway begins at the plaza and terminates at the bottom of the hill in a small platform.

To the right, a series of small six foot high walls provides a screen between the plaza and three handicapped accessible cells (G). Opposite these cells a raised bed of roses forms a u-shape around a central raised bed with saucer magnolias planted within the center square (H).

To the north of this rose garden is a ramp which leads down from the central plaza to a public garden. This ramp garden (I) slowly twists its way around a rectangular shape, descending by ramps at every corner, Irish junipers form a straight line against the west and north walls. One continues down to the last ramp, and turns the corner. A series of Japanese maples are planted against a dark granite wall with a floor of peastone gravel. The Japanese maple's sculptural form contrasts with the uniformity of the dark wall. A small rectangular pool of water ends this journey.

- Legend:
- A Parking Area
 - B Entrance Plaza
 - C Cherry Orchard
 - D Chapel
 - E Central Plaza
 - F Community Building
 - G Handicapped Accessible Cells
 - H Rose Garden
 - I Ramp Garden

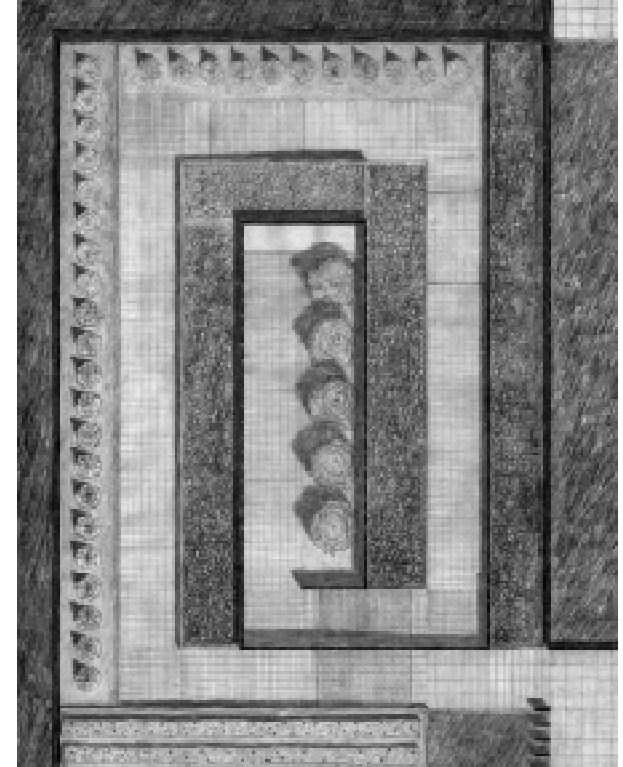
Upper Site Plan Details

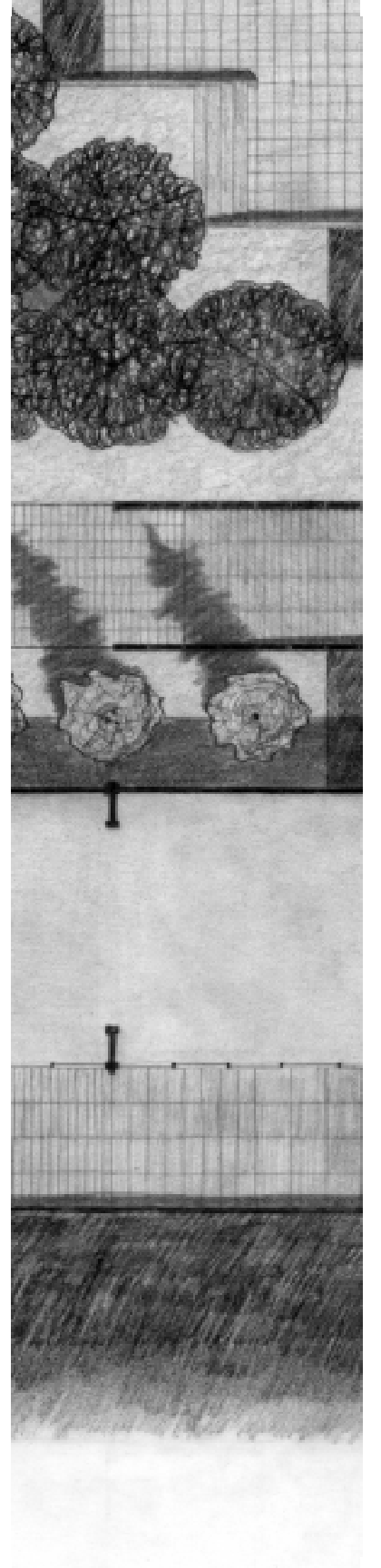
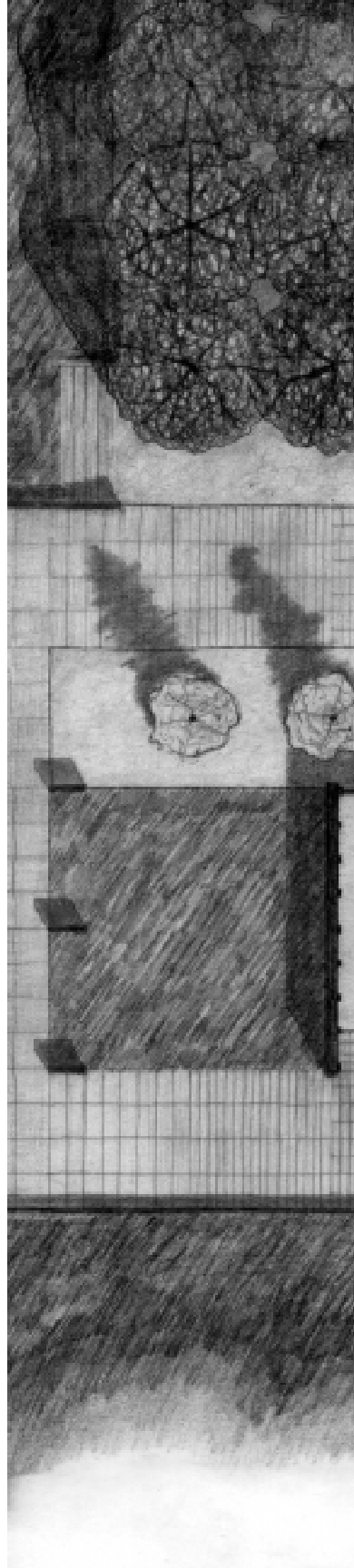
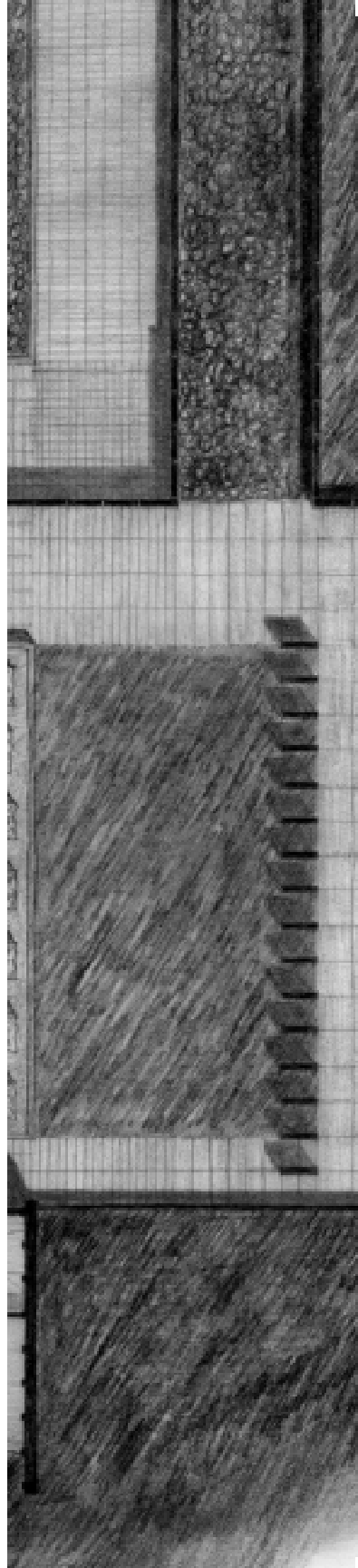
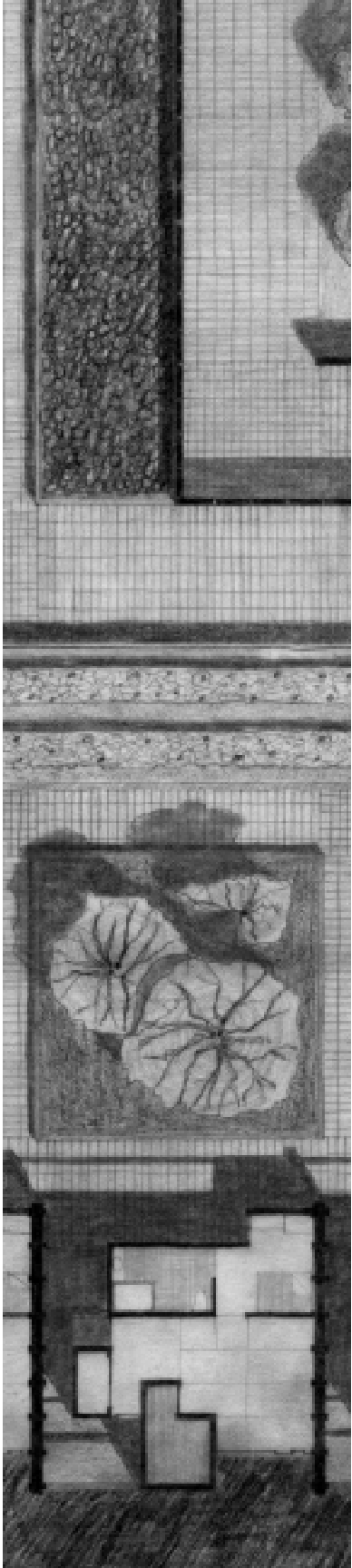
The details opposite describe the rhythm and textures of the natural and man-made surfaces found on the upper site. The entrance plaza (4) gives way to staggered stairs and grassy slopes which alternate along the northeastern edge of the cherry orchard. The opposite end of the cherry orchard is bordered by the chapel street with a series of stairs leading up from the orchard with its peastone floor. The orchard's floor surface contrasts to the flat even surface of the walkways and plazas.

Looking at all four details we see that the granite floor tile changes in size and shape depending on its location. In the central plaza (3, left side) the tile are large and square while the entrance plaza's (4) are much smaller squares. The gradation of tile size and shape is best seen in the walkways, changing in size and shape with the movement along the path. The tile covering the walkway to the ramp garden (2), for instance, becomes more rectangular and smaller as it moves away from the central plaza.

Southwest of the central plaza, handicapped accessible cells (1) have been designed to accommodate wheelchair bound guests. Besides the obvious use of a single floor level throughout the cell, the baths are larger than those found in the cells on the slope. In addition, the foyer closet has been shifted to allow the front door to be moved perpendicular to the secondary axis. This allows for more privacy for the handicapped guest while allowing necessary proximity to the public areas of the site. In addition, a series of six foot high walls screens these cells from the central plaza. Just to the north of the cells is the rose garden, with the walkway to the ramp garden just beyond.

In the smaller scale inset (this page) we see the entire ramp garden. The dark granite walls of the ramp garden start out at four feet in height from the plaza's floor. As one travels around the ramp garden, however, the walls slowly gain in height due to the descending floor elevation. At the final promenade along the Japanese maple path, the walls are twelve feet high. The ramp garden is a place for walking and contemplating. The change in wall height allows the visitor to leave the outside world behind, if only for a short time.







The trees and plantings used on the upper site are an integral part of the total design. They are treated as any other building material would be, with consideration to how they change season by season, year by year.

The orchard is composed of a grid of cherry trees (*prunus serrulata*) whose pink blossoms come out in late April and early May. The trees grow in a more upright position when young, then spread out as they mature.¹ This is important because this will allow people to walk amidst the grove throughout the tree's maturation, culminating with a beautiful flowered canopy when the tree fully develops. A deciduous tree, the cherry's leaves drop in autumn, better revealing the interesting texture of the tree's bark.

Paper birch (*betula papyrifera*) is used along the north side of the community building, providing a striking contrast against the building's exterior materials.

Saucer magnolia (*magnolia x soulangiana*) and floribunda roses are used in the smaller private garden of the handicapped accessible cells. The roses bloom throughout the summer season. The saucer magnolia's appearance, however, changes with the seasons. The fragrant flowers open in spring, with red fruit maturing in autumn as the leaves drop.²

The Irish juniper (*juniperus communis* 'Hibernica') is used at the entrance sequence to the ramp garden, chosen for its formal columnar appearance.³ The low lying plantings that surround the interior walls of the ramp garden are as yet undefined. The Japanese maple (*Acer palmatum*), however, is the only choice for the final sequence leading to the

small pool which terminates the ramp garden. With its sculptural form and beautifully shaped red leaves, it provides the perfect counterpoint to the dark granite wall that encloses the inner ramp garden.

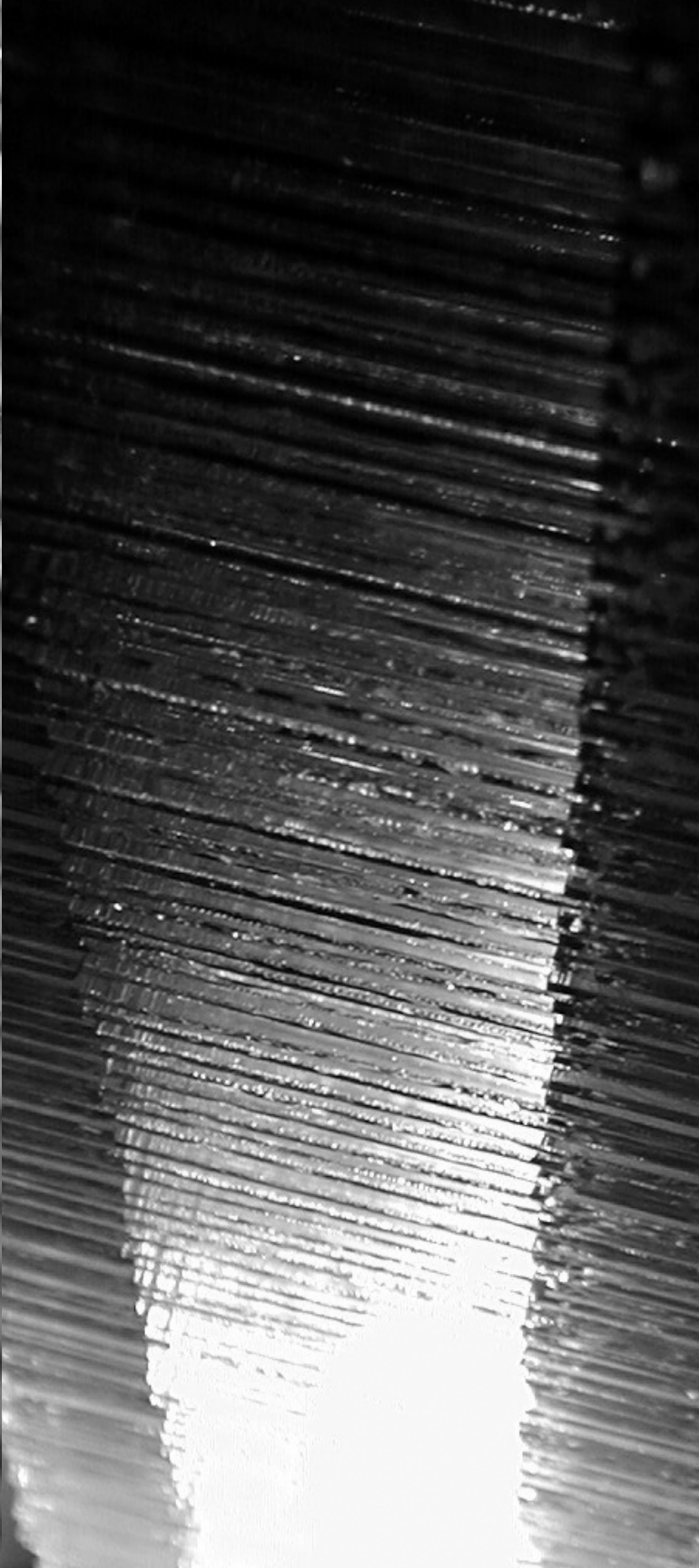
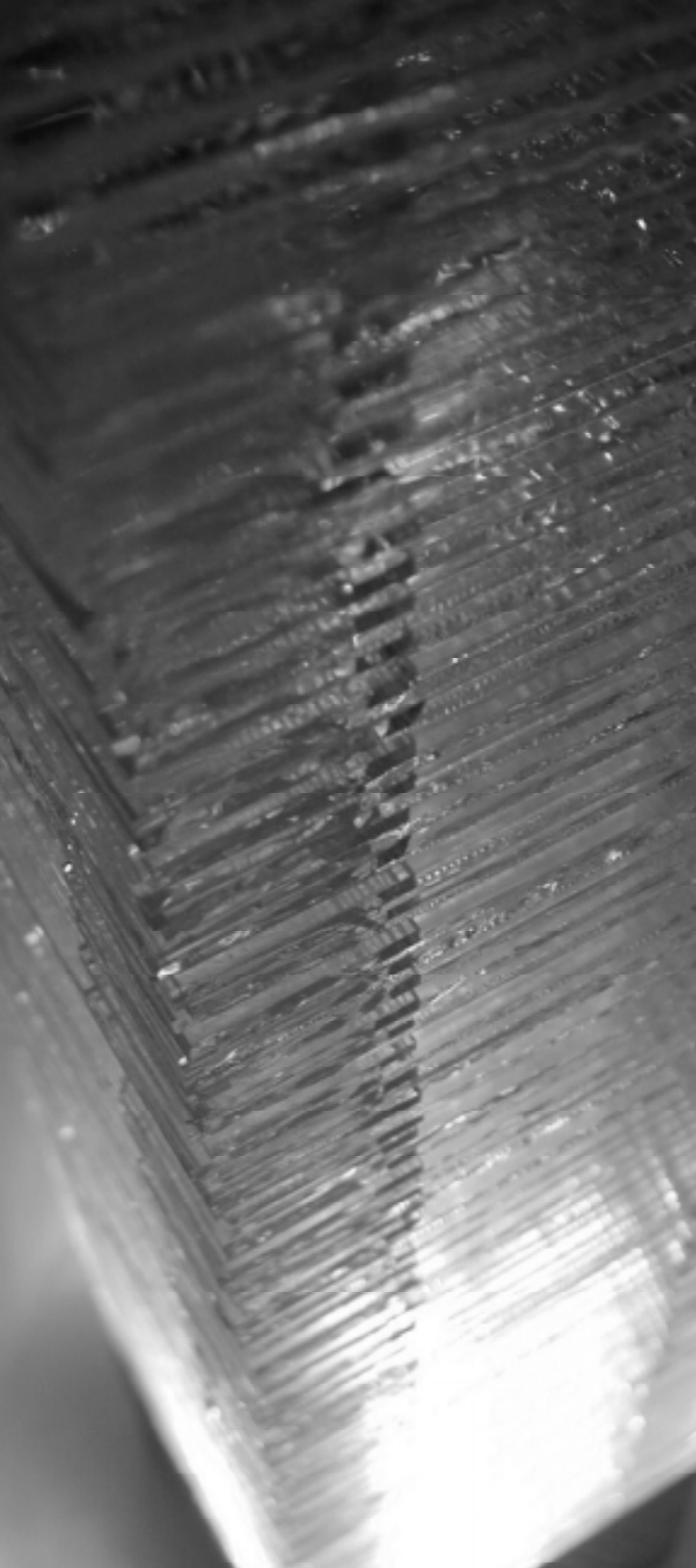
Final Thoughts

It is fitting to end this book referring to the natural materials used on the site. The *idea* of placing a tree on a site and the *reality* of planting a particular species in a precise location are two different things. Similarly, it is one thing to *think* about building a wall and quite another to *build* a wall using a specific material, of a specific size, for a specific location. One is an abstraction, the other a reality with sensuous qualities that we experience. Architecture is the reconciliation of these reciprocal relationships.

A large part of the pedagogical inquiry has investigated the nature of these relationships. This reconciliation of architectural idea and built form is accomplished by the materialization of the idea through the use of specific materials with their inherent qualities and restrictions. The learning begins when one sees these restrictions not as a hinderance to the idea, but that which can reveal the very essence of Architecture.

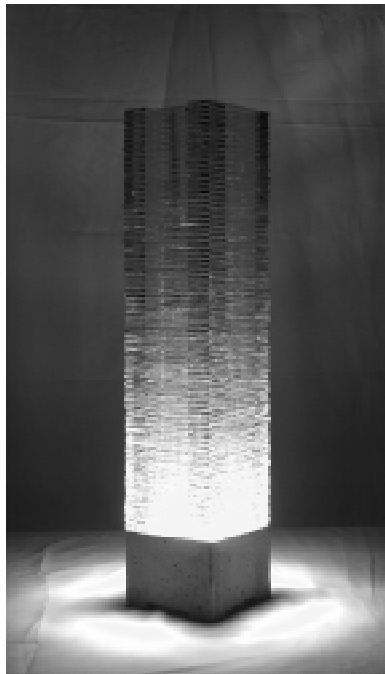
The virtue of this architecture of reconciliation lies in its ability to help Man understand his surroundings and place in the world at large. This is accomplished by bringing an awareness and appreciation of the tangible, physical world to the individual. However, we must use not only our eyes, but all of our senses to truly *know* a place. It is in this knowing, this understanding, that one is able to dwell. In dwelling one finds true peace.





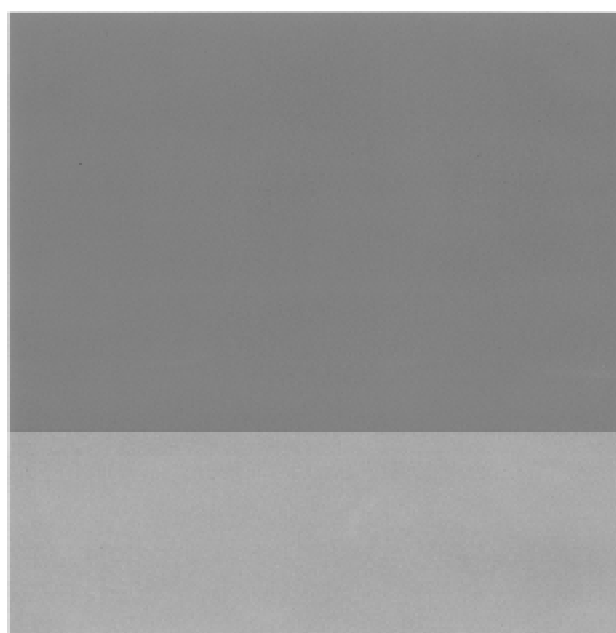
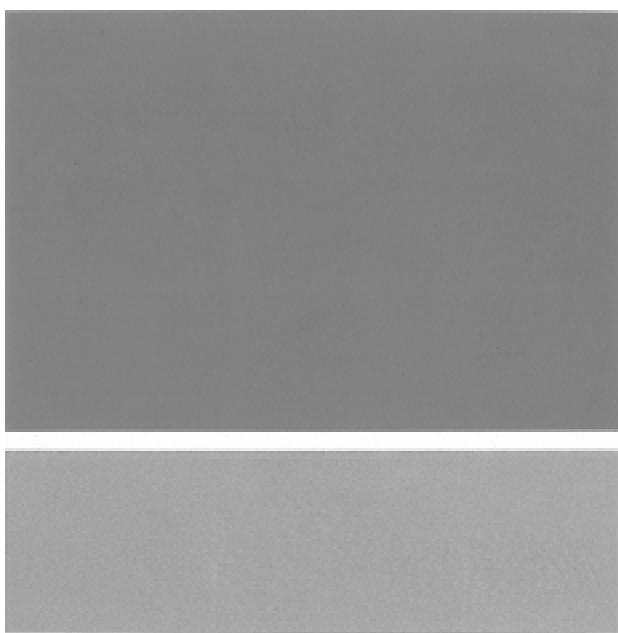
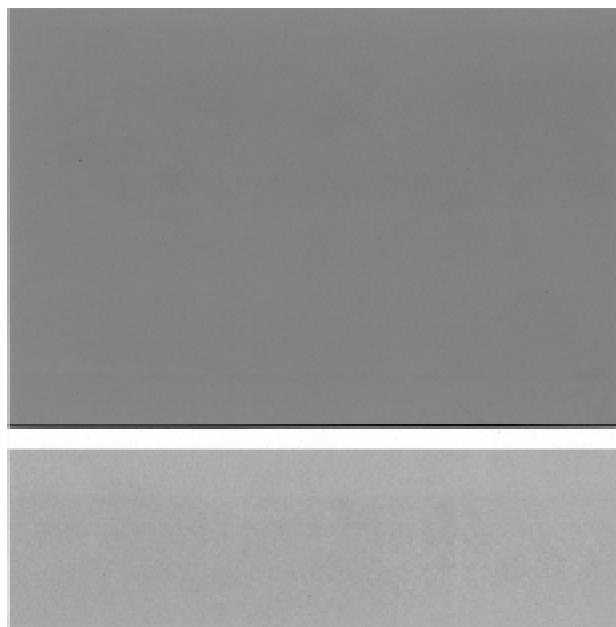
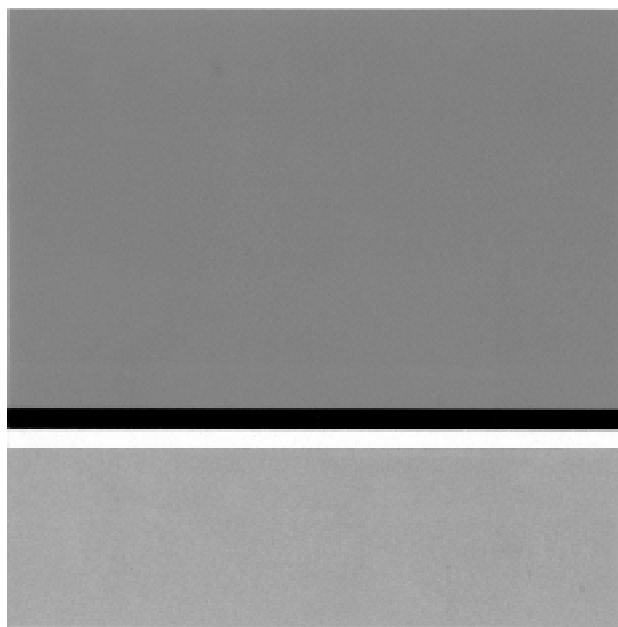
Appendix: Glass Lamp

We all assume glass to be clear. And yet, when we examine it closely, it is only clear in one direction. As we turn its side into the light a wonderful green color is revealed. The designing and making of this lamp provided a valuable study about the nature of materials and how they are perceived.



Appendix: Contrast Study

In addition to the major thesis project, several smaller studies were conducted using different media. This print series investigates the relationship between horizon, position and intermediary element.



- Atelier 5. *Atelier 5: 26 ausgewählte Bauten*. Zurich: Ammann, 1986.
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Bibliography

This list represents publications which were helpful in my studies. Some, such as the writings of Louis Kahn, Christian Norberg-Schulz and Juhani Pallasmaa were read several times. Others were read quickly, usually looking for an answer to a specific question. Still, each source was helpful as I proceeded towards my thesis.

Illustration Credits and Endnotes

All drawings and photographs are those of the author unless indicated.

Introduction

Photo, Right:
Cali, plate 5-6.

Sources: Monasticism and Meditation

Background Photo, Left:
William Brown.

Inset Photos, Left to Right:
Cali, plate 38.
Cali, plate 65.
Cali, plate 7.
Padovan, p. 153.
Padovan, p. 158.

Sources of Sketches, Left to Right:
Braunfels, p. 97.
Cali, plate 55.
Tobin, p. 89.

Precedent: Wall as Primary Element

Background Photo, Left:
Serra, p. 140.
Background Drawing, Right:
Van Eyck, p.14.
Inset Photos, Left to Right:
Rispa, p.123.
Cali, plate 6.
Ojeda, *Ten Houses...*, p.49.
Buchanan, p.47.
Rispa, p. 172.
Van Eyck, p.19.

Precedent: Building on a Slope

Photos, Clockwise, from Top Left:
Slide Library VPI&SU.
Atelier 5, *Atelier 5...*, p. 67.
Furuyama, p. 65.
Zucchi, plate X.

Precedent: Rhythm and Order

Photos, Left to Right:
Nuttgens, P. 103.
Slide Library VPI&SU.
Pizzi, p. 39.
Venturi, p.58.

Precedent: Use of Material

Photos, Left to Right:
Brownlee and De Long, p.145.
Ojeda, *Ten Houses...*, p.6.
Brownlee and De Long, p.234.
Ojeda, *Ten Houses...*, p.94.
Jensen, pp.62-63.

Site

Map:
USGS, Orange VA Quadrangle.

Precedent: Ordered Landscape

Photos, Clockwise, from Top Left:
Plechnik, p. 76.
Hilderbrand, p. 51.
Scully, p. 45.
Kiley and Amidon, p. 117.
Inset Photo:
Scully, p. 99.
Background Plan, Right:
Hazelhurst, p. 86.

Materials of the Upper Site

Photos, Clockwise, from Top Left:
Ferguson, p.66.
Lancaster, p. 22.
Latimer, p. 46.
Helmer, p. 53.
Helmer, p. 266.
Kiley and Amidon, p. 83.

Endnotes

1. Lancaster, p. 108.
2. Helmer, p. 182.
3. Helmer, p.53.

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